AVIATION

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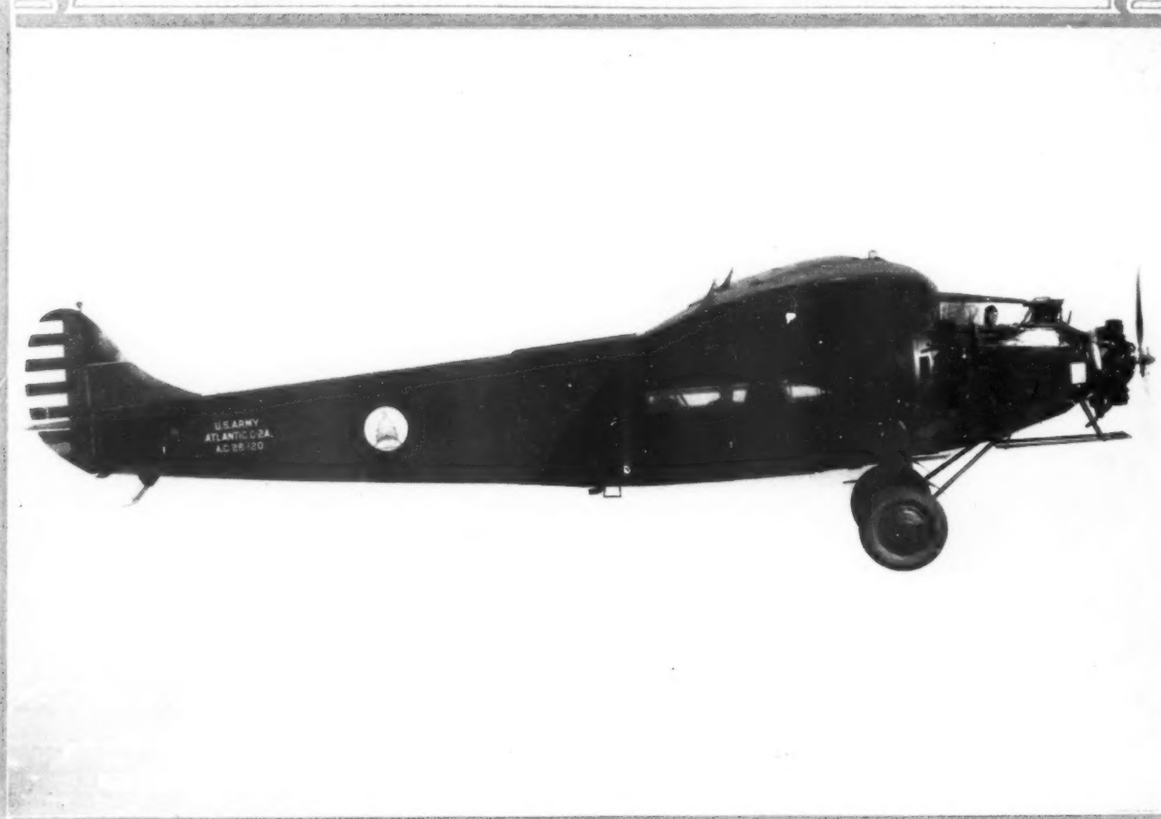

Flight picture of the record breaking Fokker Army Transport, "Question Mark"

VOLUME XXVI

NUMBER 2

Special Features

The Federal CM-3

Demagnetization Tests

Selling Aeronautics to the Public

AVIATION PUBLISHING CORPORATION
250 WEST 57TH STREET, NEW YORK

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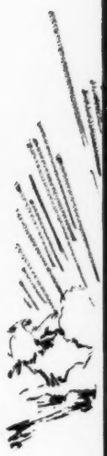
"Mobiloil lubricates perfectly in first Antarctic flight in history"



—radioed CAPT. WILKINS

This message was sent by radio and cable to the Vacuum Oil Company on November 22 by Capt. Sir Hubert Wilkins and Lieut. Ben Eielson, who are now engaged in Antarctic explorations.

Additional evidence of Mobiloil's successful lubrication was contained in their radio message to the Wright Aeronautical Corporation: "Whirlwinds perform perfectly on *first Antarctic flight* ever made."

Perhaps in no flight in history has perfect lubrication been so important as in this Wilkins flight — the first in the Antarctic. These two fliers with only one spare plane and three assistants have gone to the Antarctic on a scientific expedition to study weather conditions which influence the whole world.

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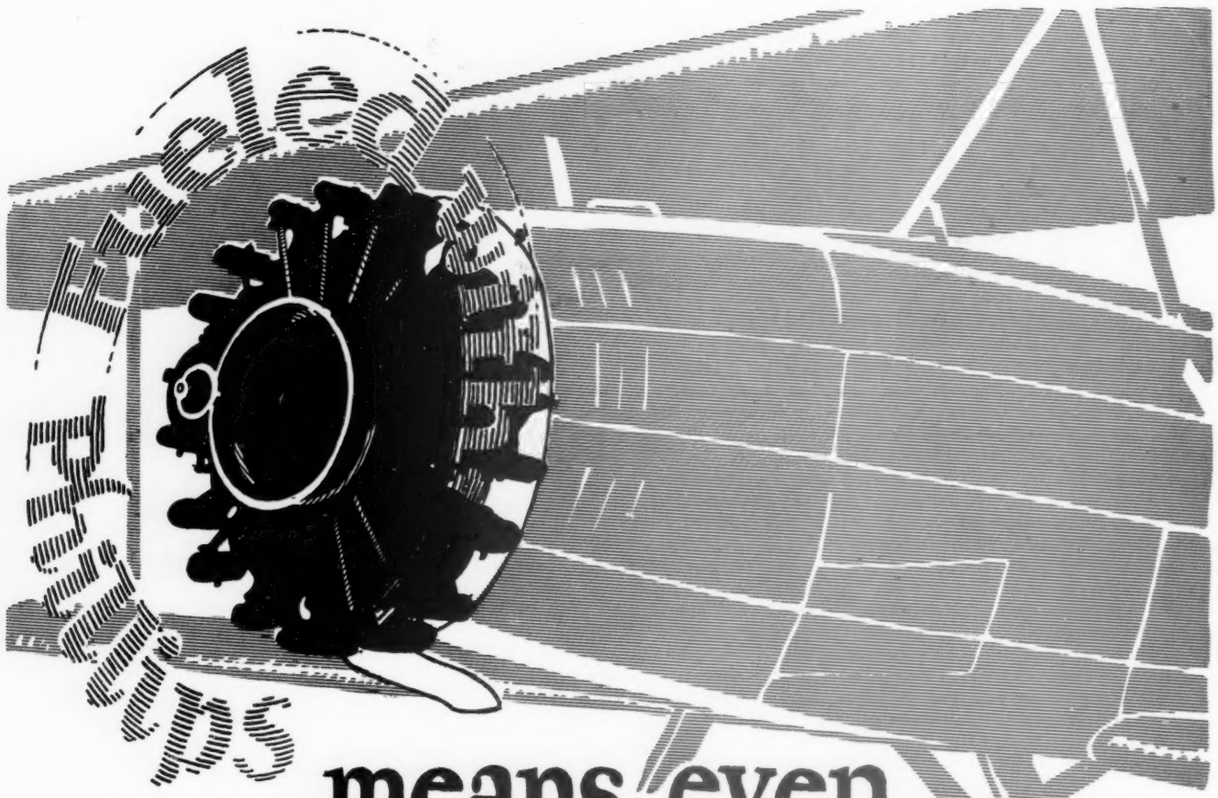

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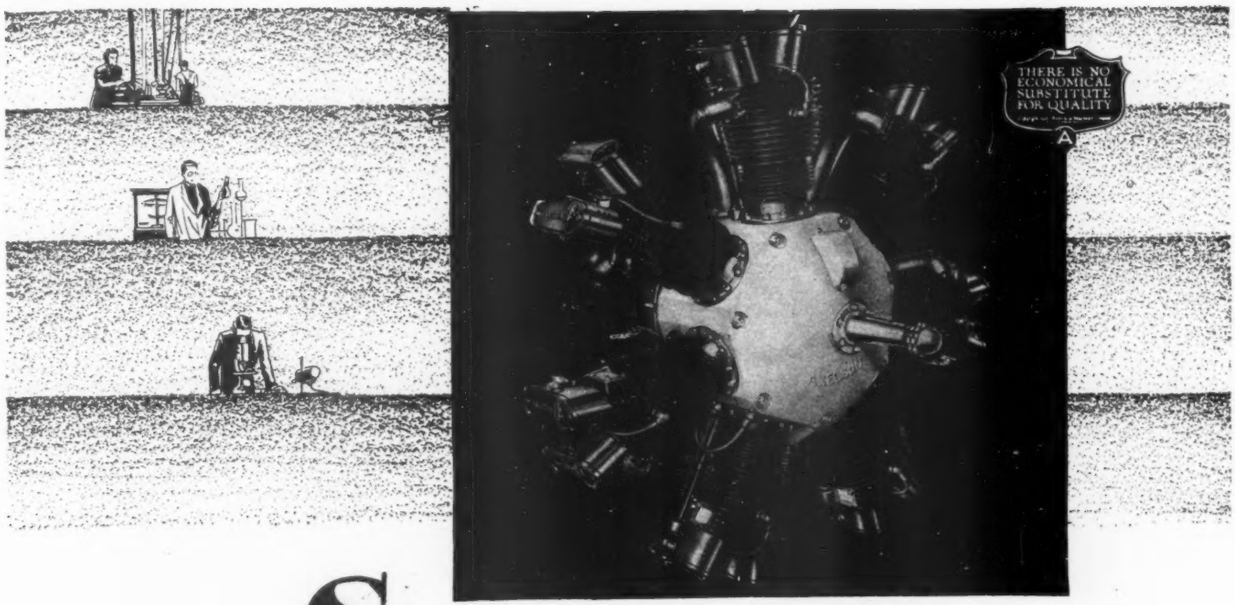

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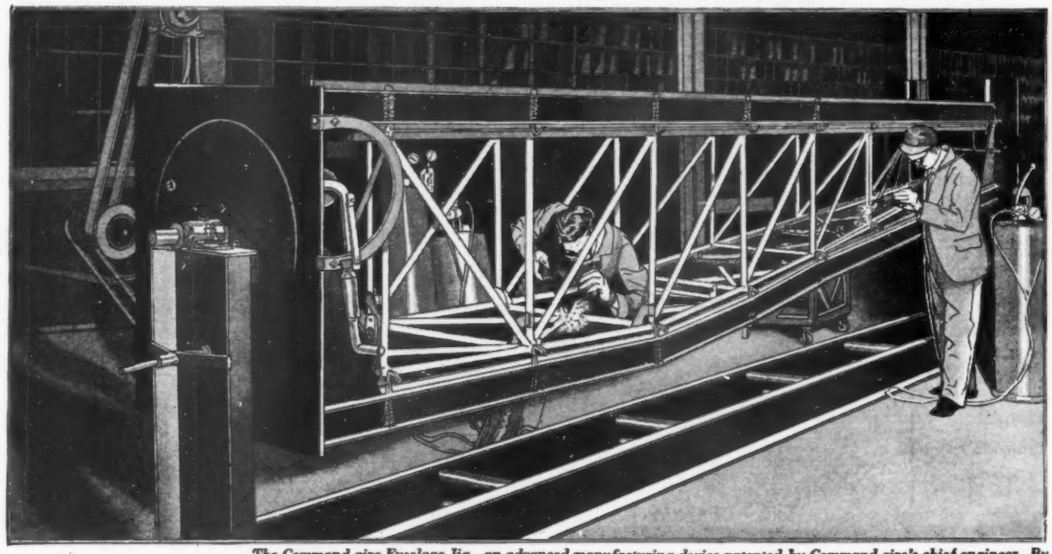

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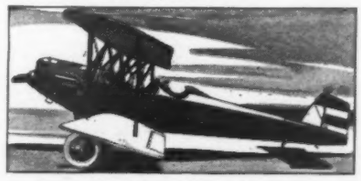

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Photo by R. Raymond Martin

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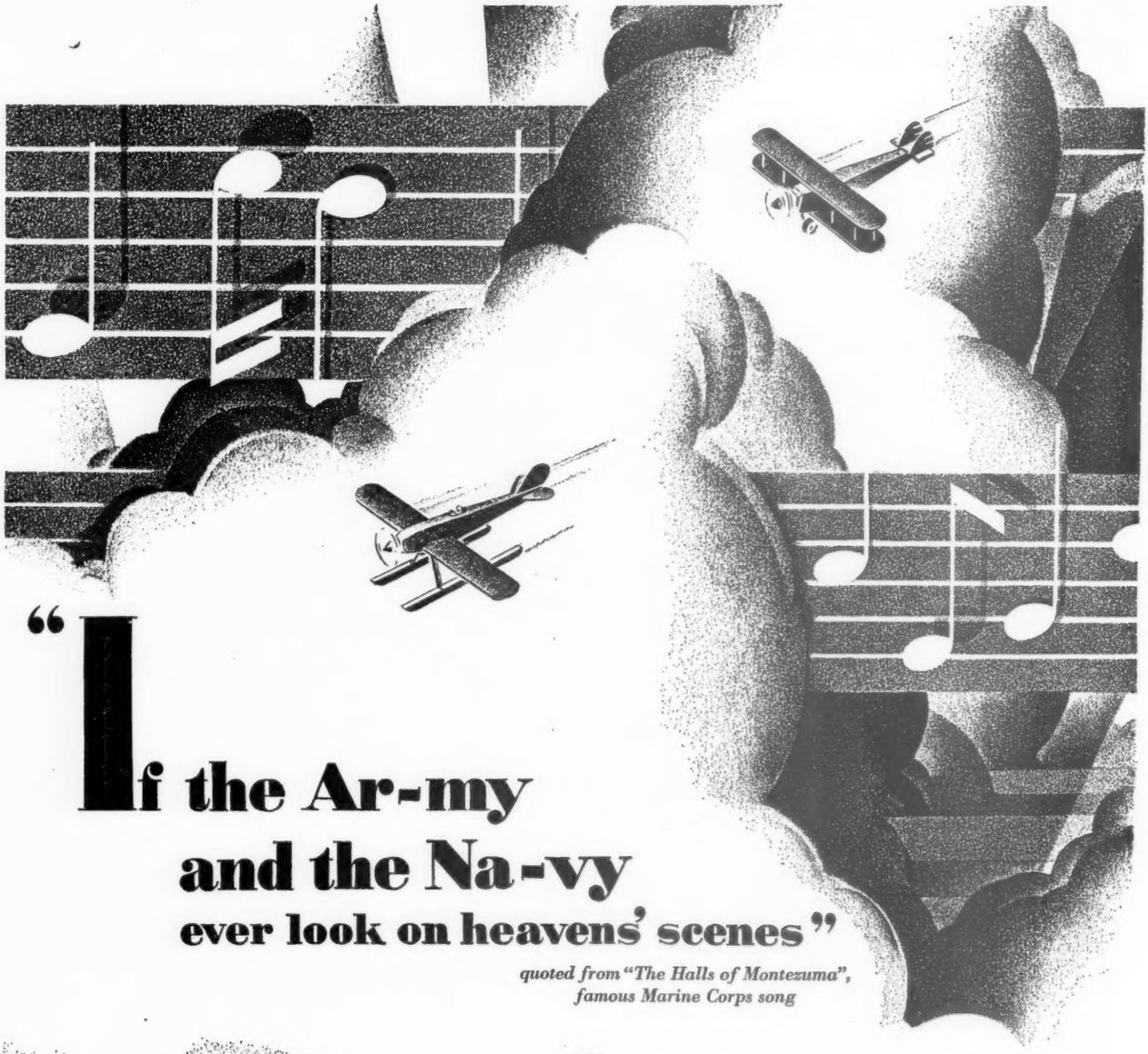
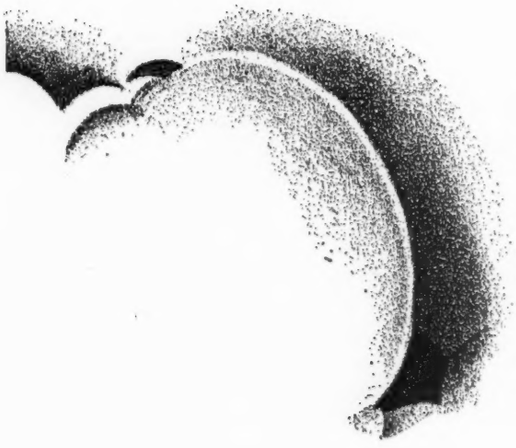


"If the Ar-my and the Na-vy ever look on heavens' scenes"

quoted from "The Halls of Montezuma", famous Marine Corps song



THE MARINE who wrote that old song evidently had some doubts about the Army and the Navy *ever* looking on heavens' scenes. But that was long before the services took to the skies.

Today flights of Army, Navy and Marine pilots cruise the heavens. We don't know if they "find the streets are guarded by United States Marines". . . . . But we *do* know that they use Spalding Aviation Equipment, and find that it gives the "ceiling" in satisfaction.

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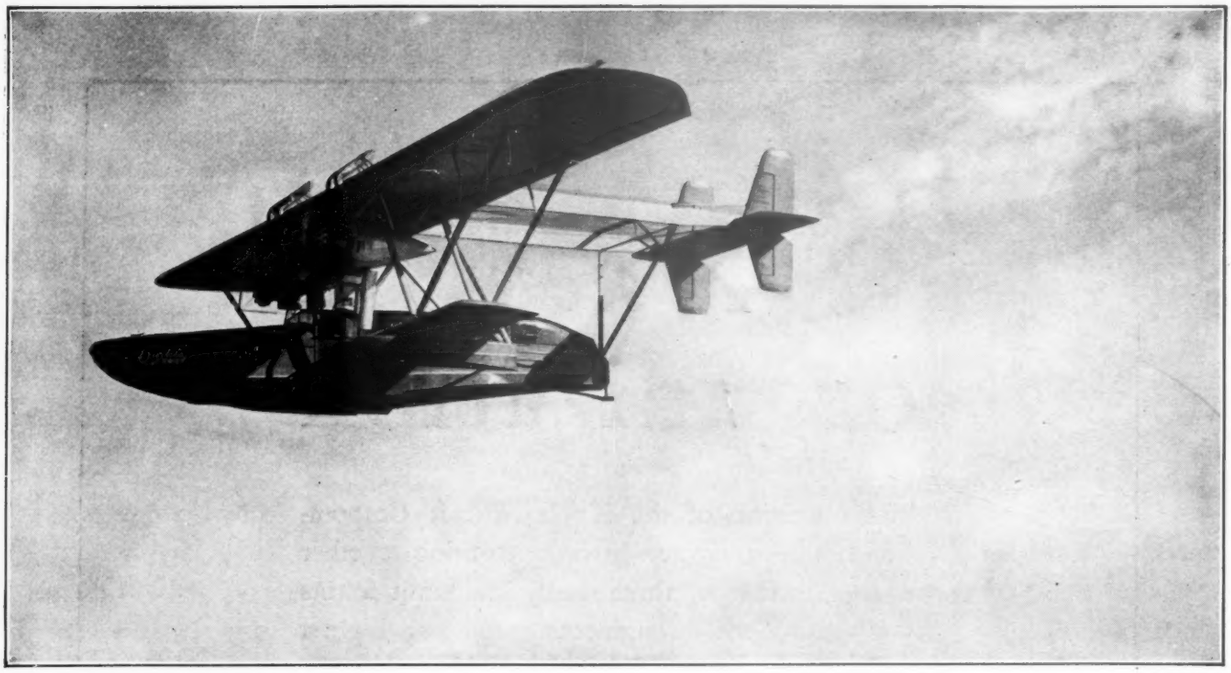
Wichita, Kansas

A1-12-Gray



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We stand ready to prove this bold statement to responsible dealers at any time.

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AND

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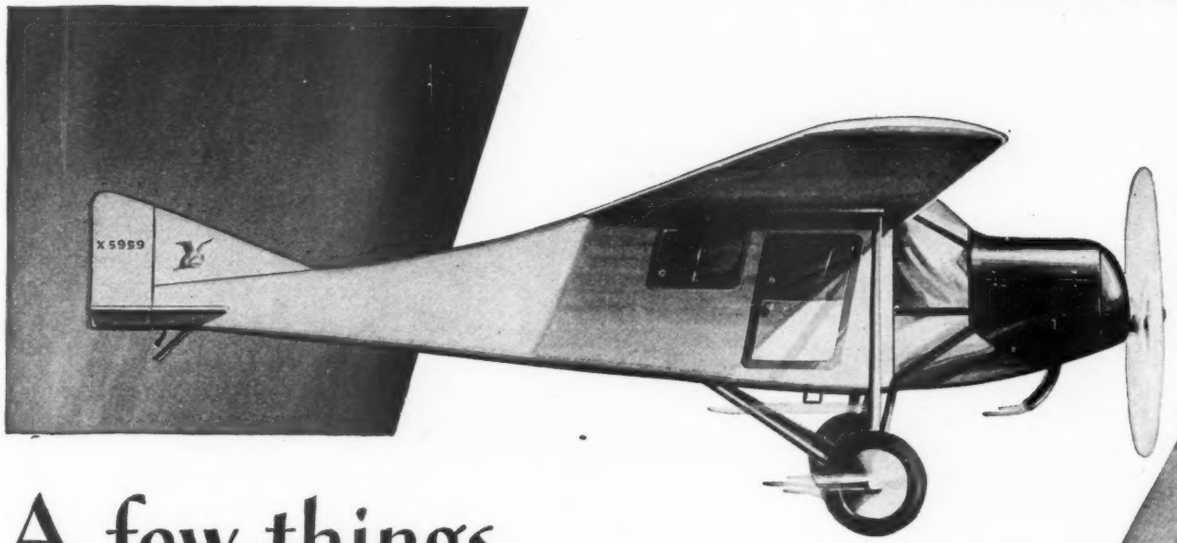

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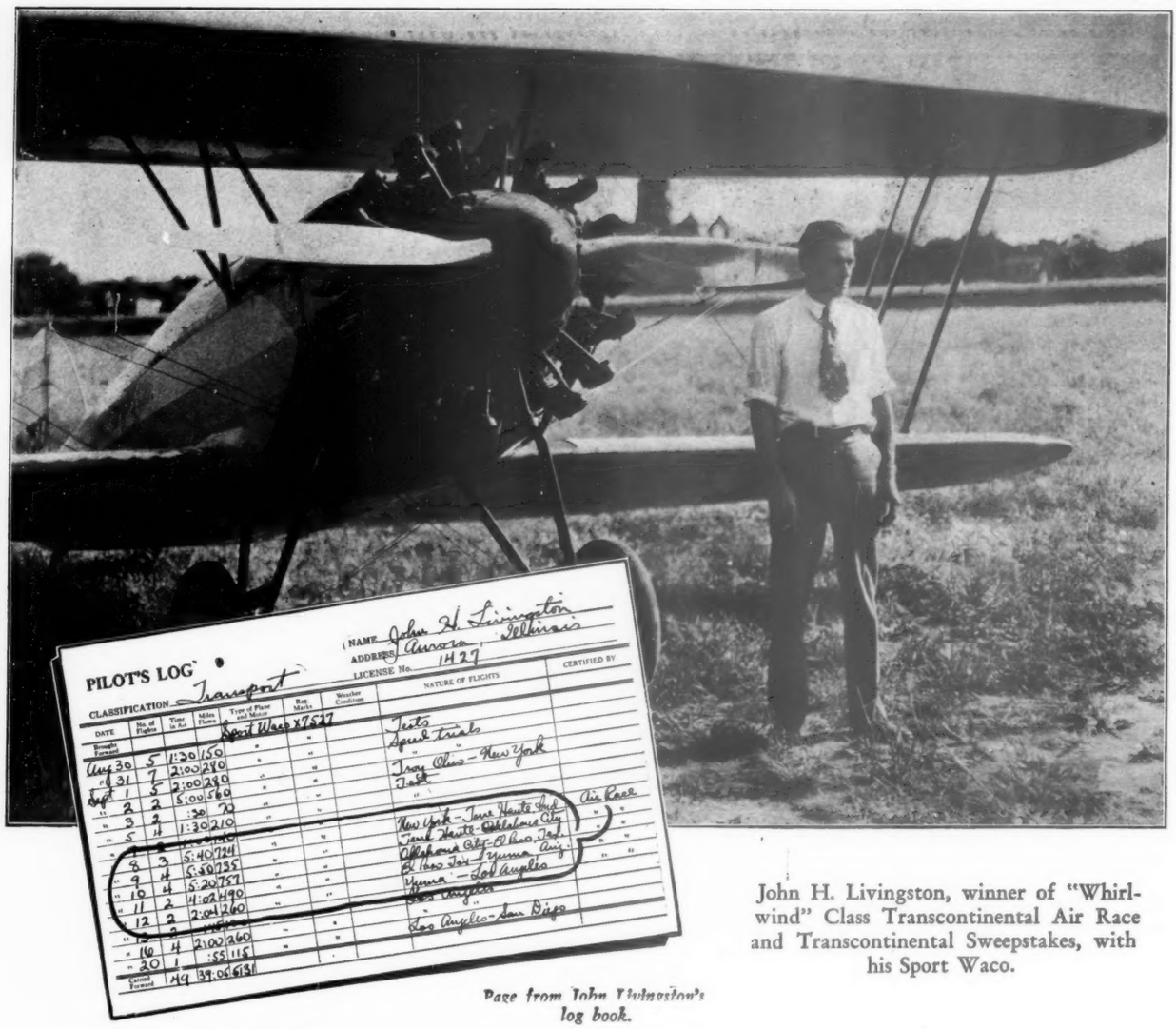

PILOT'S LOG

CLASSIFICATION — Transport

NAME John H. Livingston
ADDRESS Aurora, Illinois
LICENSE No. 1427

DATE	No. of Flights	Time in Air	Miles Flown	Type of Plane and Motor	Reg. Marks	Weather Condition	NATURE OF FLIGHTS	CERTIFIED BY
Brought Forward				Sport Waco	X7527			
Aug 30	5	1:30	150	"	"		Tests	
" 31	7	2:00	280	"	"		Speed trials	
Sept 1	5	2:00	280	"	"		" "	
" 2	2	5:00	560	"	"		Troy, Ohio - New York	
" 3	2	:30	70	"	"		Test	
" 5	4	1:30	210	"	"		"	
" 8	3	5:40	724	"	"		New York - Terre Haute Ind	Air Race
" 9	4	5:30	735	"	"		Terre Haute - Oklahoma City	
" 10	4	5:20	757	"	"		Oklahoma City - El Paso, Texas	
" 11	2	4:02	490	"	"		El Paso Tex - Yuma Ariz	
" 12	2	2:00	260	"	"		Yuma - Los Angeles	
" 13	2	[illegible]		"	"		Los Angeles	
" 16	4	2:00	260	"	"		" "	
" 20	1	:55	115	"	"		Los Angeles - San Diego	
Carried Forward	49	39:00	6151					

Page from John Livingston's log book.

John H. Livingston, winner of "Whirlwind" Class Transcontinental Air Race and Transcontinental Sweepstakes, with his Sport Waco.

"The Sport Waco's exceptional maneuverability, together with its quick take-off and slow landing speed, puts it far in advance of similar planes being flown at the present time.

"My log book shows a total of 10,291 miles covered in my Sport Waco, at an average speed of approximately 130 miles per hour.

These figures, in my opinion, constitute an excellent record for a commercial plane."

John H. Livingston

President,
Mid-West Airways Corp.

Reasonably prompt deliveries with OX5, Siemens-Halske, Hispano-Suiza and "Whirlwind" motors, type certificates 9, 13, 26, 41, 42. Write for Catalog AV2A.

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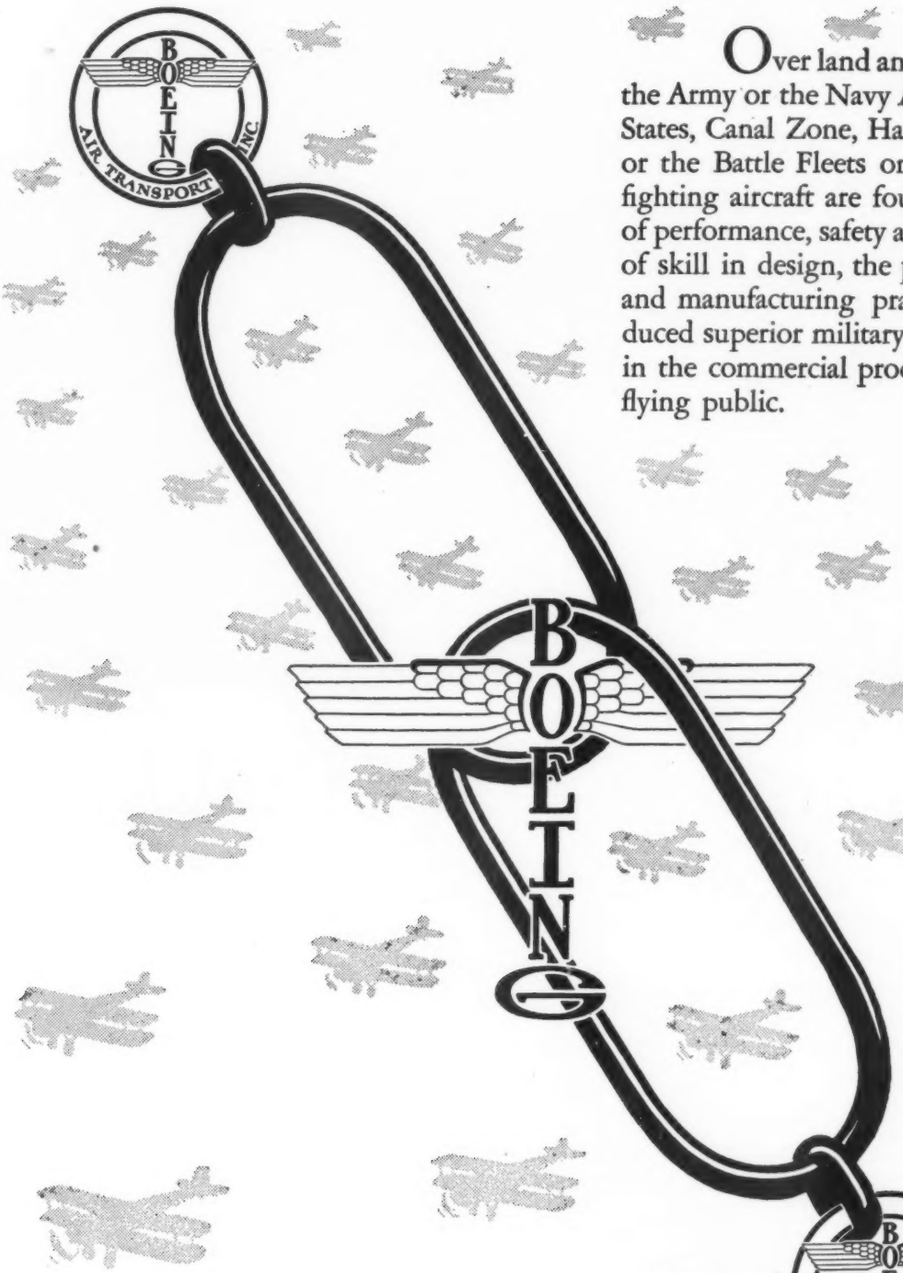

Over land and sea, whether it be with the Army or the Navy Air Forces, in the United States, Canal Zone, Hawaii, or the Philippines, or the Battle Fleets on the high seas, Boeing fighting aircraft are found setting the standard of performance, safety and sturdiness. The result of skill in design, the perfection of mechanical and manufacturing practices which have produced superior military equipment, are reflected in the commercial products now offered to the flying public.

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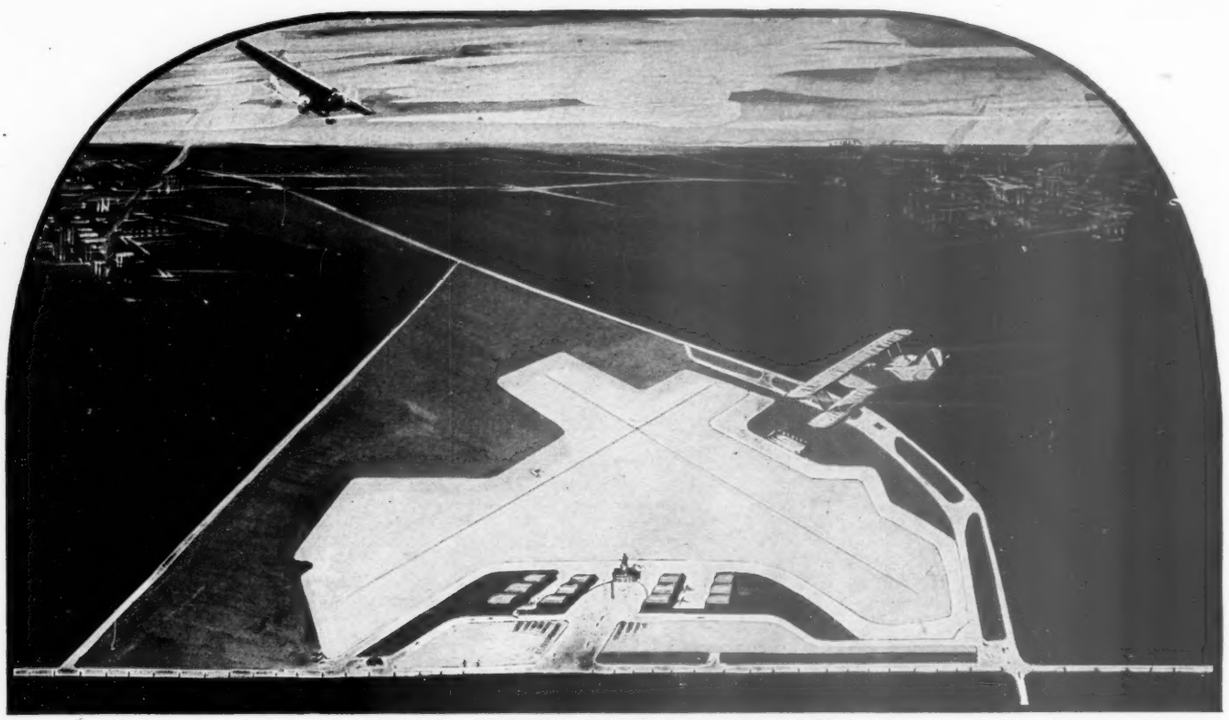
Boeing Airplane Co.

Seattle, Washington

BASIBAW



Airport of Austin design, planned to serve two neighboring cities in Ohio.

Airports and Aviation Buildings

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Since the selection of site, design, construction and management of an airport is of such a technical and highly specialized nature, anything but expert advice and counsel may easily jeopardize the aeronautical future of a city.

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THE AUSTIN COMPANY, *Engineers and Builders*, Cleveland

New York Chicago Philadelphia Detroit Cincinnati Pittsburgh St. Louis Seattle Portland
The Austin Company of California: Los Angeles and San Francisco The Austin Company of Texas: Dallas

AUSTIN

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Firm_____ City_____

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Vol. XXVI January 12. 1929 No. 2

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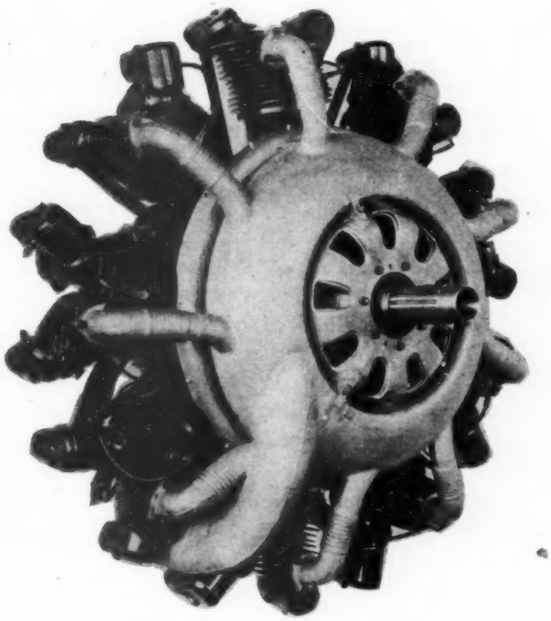

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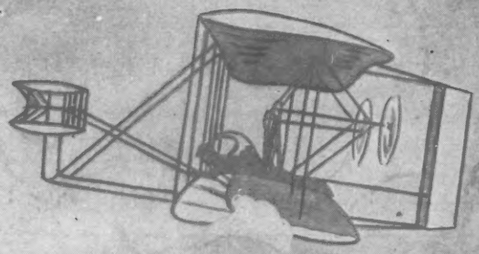

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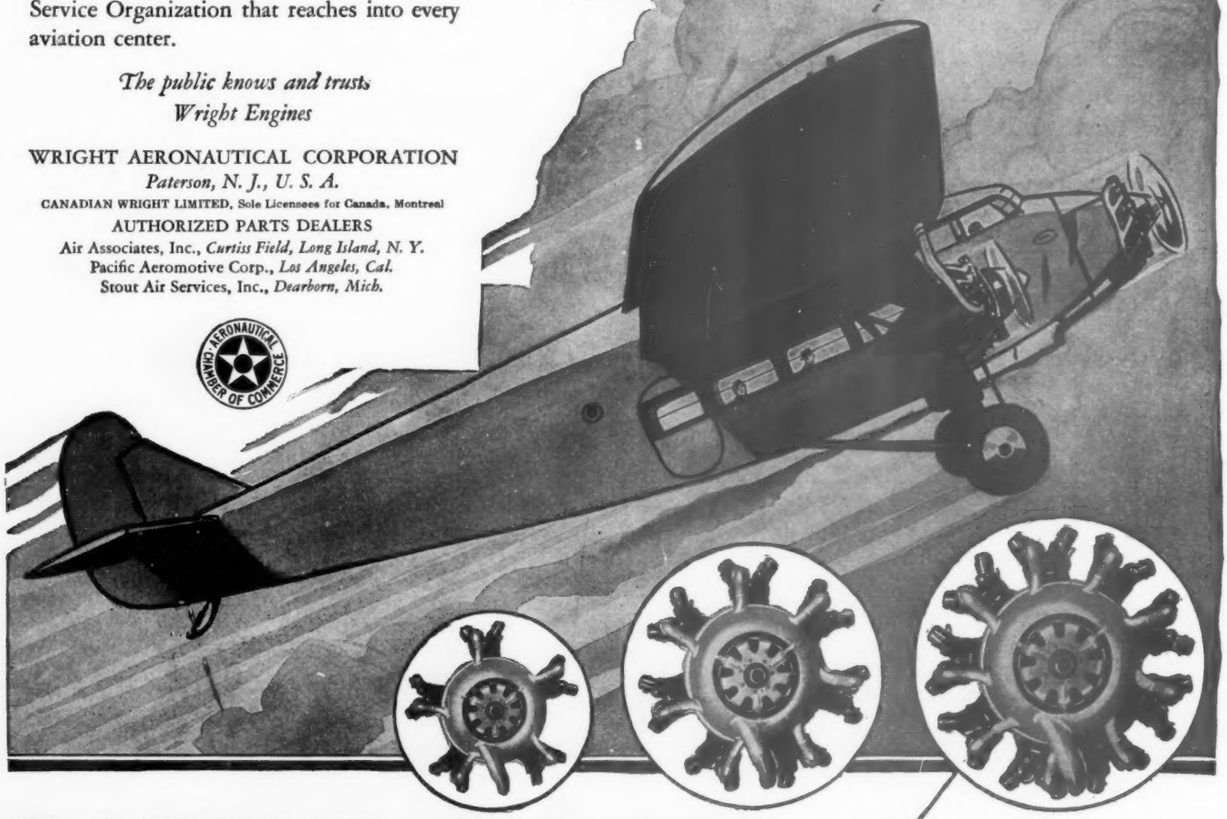

WRIGHT

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AVIATION

The Oldest American Aeronautical Magazine

Vol. XXVI JANUARY 12, 1929 No. 2

The Question Mark

MAJOR SPATZ and the crew of the Question Mark certainly started the New Year right. Their record is most amazing. A comparison with student flying may perhaps give some idea of what they have done. When a student stays in the air one hour he comes down quite tired and feels he has done a lot of flying. The ten hours that it normally takes to solo seems like a vast amount of time. When the student has done fifty hours he feels that he is quite a flier. When he has passed the hundred mark he is sure that he has piled up a vast amount of experience. The crew of the Question Mark have done this and more in a single flight.

The flight was a competition between the endurance of the men and the endurance of the plane. Although such a contest can in a way be regarded as a stunt yet it really has a considerable amount of value. A flight of such great length brings to the public's attention the fact that the airplane is a reliable vehicle and that it can be flown without too great an amount of fatigue to the crew. By pushing toward the limit of human endurance certain conclusions in regard to the comfort of pilots and passengers may be reached which could not be so well ascertained in shorter flights. Such long flights without adjustment are proof of an excellence of both engine and plane and prove the great advantages of being able to throttle the power plant down to a speed where the maximum power is not needed.

The flight also has its humorous elements. One can imagine the disgust of the lighter-than-air enthusiasts when they see all their records going by the board through such "unfair" methods as refueling in the air. The Navy, which scored such a triumph over the same district during September's air meet, must also be rather annoyed at having the Army stay so continuously in the air and on the front page. One can also imagine a weary aviator stepping out of a plane after a hard flight and having the boss tell him that he should be able to stay in the air for a hundred hours without getting tired.

The flight has required a considerable amount of skill and also good judgment. Refueling in the air is a very ticklish piece of business, and praise should be given to the fueling planes and pilots as well as to the crew of the plane itself. Making physical contact between two planes, especially at night, and keeping them exactly the same distance apart for a considerable period of time is no easy matter.

The immediate practical value of refueling is somewhat indefinite but uses might be found. For example, the landing of a passenger plane during the middle of the night would in all probability awaken most of the passengers, but if it were possible to fly straight through the night there would be considerable advantage gained. Then there are large areas where it would be very difficult to build fields of sufficient size for the regular take off and landing of the giant planes which the future is likely to bring. In these cases it might be possible to establish landing fields of sufficient size for the refueling planes, and this would be especially to the point in places where the amount of traffic does not justify the landing of a through express plane. As refueling must be done in fairly good weather, it might be possible for the fueling plane to fly up through the clouds and meet the express plane in the clear stretches of the upper atmosphere. On the whole it does seem as if the flight of the Question Mark was more than a mere stunt and that such an idea has very real practical possibilities.

An Engineering Supplement

ALL other things being equal, the manufacturing organization that has good engineers and good engineering facilities will pull far ahead of the manufacturing organization that is weak in this department. During the last two years, however, there has been such a demand for planes that engineering has been comparatively neglected, and the majority of effort has been exerted in the matters of financing and production. In fact, there has been a tendency to put the engineers themselves and the work that they accomplish in a place of secondary importance. In four out of five firms the president, sales manager, and test pilot will be well known, but few, if any, outside of the company will know the name of the chief engineer.

In its next issue AVIATION inaugurates an Aeronautical Engineering Supplement, which it is hoped will contribute somewhat toward dignifying the profession of aeronautical engineering. Most engineers, outside of those who have gone into executive work have been limited in their audience to the personnel of their own companies. One of the aims of the Supplement, which will appear in every third issue of the month, will be to act as a forum for discussion of engineering questions and for the exchange of ideas. The names of the engineers who contribute to the Supplement will not only become known to the industry in this country but abroad as well.

There has long been a need for such a supplement, and it has not been undertaken heretofore because it involves considerable expense of time and money with very little prospect of any direct financial return. However, due to the altogether pleasing progress and prosperity of aeronautics in general it is believed that the inauguration of the Supplement is justified at this time if only as an additional service to the industry. The difficulty of obtaining suitable material for the Supplement is fully realized, but AVIATION hopes to obtain original material either in the form of new theories or formulas, or in the reports of research work which have heretofore been unpublished. In the task of obtaining such material the fullest cooperation of the industry is sincerely solicited, for the Aeronautical Engineering Supplement should have a most informative and stimulating effect upon the engineering departments of every aeronautical organization.

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The Federal CM-3

New Hallett Powered, Three Place, Cabin Monoplane Has Structure Built Entirely of Welded Steel Tubing

By CHARLES F. MCREYNOLDS

INTRODUCTION of the Federal CM-3 cabin monoplane to the commercial aircraft market follows more than two years of engineering development and approximately one year of test flying. During this time the Federal Aircraft Corp., an expansion of the Ryan Mechanics Monoplane Co., has been seeking to perfect the application of welded steel tube structures to moderately priced all steel planes adaptable to quantity production methods.

The "Lone Eagle" all steel cabin monoplane will be remembered as the first product tested. It was described in detail on page 434 of the Feb. 20, 1928 issue of AVIATION. A Whirlwind powered, five place cabin plane, with a full cantilever wing, the "Lone Eagle" has been widely flown, and proved thorough satisfactory. When full quantity production has been reached on the more moderately priced CM-3 model it is planned to institute a limited production schedule on the Lone Eagle for the custom built market.

Design of the Federal CM-3 has been chiefly directed to the adaptation of advantages of all steel construction to the manufacture of a small all purpose cabin plane. The resulting model is a three place, closed cabin monoplane of externally braced, high wing type. Although the first plane has been tested with the Hallett 526 seven cylinder, radial engine which develops 130 hp. at 1800 r.p.m., any engine up to the 225 hp. Wright Whirlwind may be installed without structural changes and without exceeding the minimum safety factor required by the Department of Commerce.

By placing the three seats in line and providing optional dual controls to the rear seat, the CM-3 is made ideal for advanced training. The student may be placed in either front or rear seat and still converse readily with the instructor due to the completely enclosed cabin. The in-line seating also has advantages for sight seeing flying, passengers having unobstructed vision on either side and more room than is usual despite a maximum fuselage width of but 35 in. For aerial mapping or survey work the completely protected cabin in a comparatively low priced plane should prove desirable, while the excellent flight characteristics of the plane make it a logical choice for transport air lines requiring smaller planes for feeder lines and auxiliary flying.

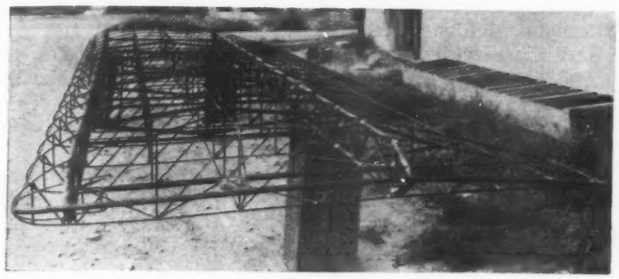
Carries a Pay Load of 500 lb.

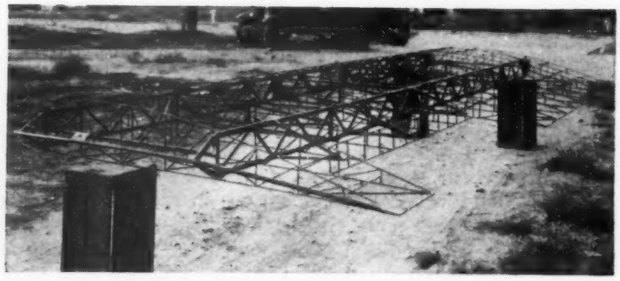
The CM-3 weighs 1500 lb. empty, will carry a pay load of 500 lb., and has a gross weight loaded of 2430 lb. Performance figures have been determined by test flying over a three months' period at the hands of O. R. McNeel and Charles R. "Dick" Bowman. Although these figures are for the Hallett engine, other engines will be tested in order to furnish data for those who wish to use any standard power plant of suitable size. High speed attained was 105 m.p.h. at 1850 r.p.m., cruising speed 95 m.p.h. at 1600 r.p.m,, and landing speed was 35 m.p.h. All performance figures were established with full load.

Flight stability unusual for so small a plane has been repeatedly demonstrated by long periods of hands off flying with the CM-3, and by full right and left turns on rudder alone.

With a span of 39 ft. 6 in. and a 7 ft. chord, the Federal CM-3 wing has a low aspect ratio and excellent structural characteristics. The total supporting surface

Front quarter view of the new Hallett powered Federal CM-3 cabin monoplane.





Two sections of the uncovered wing of the new Federal CM-3 cabin monoplane.

is 256 sq. ft., height of the plane overall 7 ft. 10 in., and length overall 25 ft. 9 in. Although the plane is fabric covered in the usual manner, the entire internal structure, including compression members, wing spars, and even the ribs, is built up of chrome molybdenum steel tubing welded at the joints. The design was developed by O. R. McNeel, Fred C. Ayars, and Henry Hunold, with stress analysis by William J. Waterhouse.

The first plane has wing and horizontal tail surfaces painted white, fuselage and struts blue, and vertical tail surfaces red, but it is planned to finish all standard production models with a wine brown fuselage and burnt orange wing and tail.

Wing Built in Two Panels

Particular attention was given to economy of production in designing the wing with the result that the same rib size is used all the way across, and front and rear spars are interchangeable. The wing is built in two panels, each being pinned to the center section by four ½ in. nickel steel bolts and externally braced to the lower longeron of the fuselage by two 18 gauge steel tube struts 3 in. in diameter and faired with sheet duralumin. All wing fittings are of heavy gauge flat 1025 steel. Four compression members built up of ¾ in. 20 gauge chrome molybdenum steel tubing into a K structure are permanently welded into each wing panel so as to take the torque between spars.

Spars contain cap members of 1⅛ in., 18 gauge tubing out to the strut fitting and 20 gauge tubing of the same diameter from strut fitting to wing tip. Between the caps steel tubing is welded in Warren truss structure with diameters of tubing varying from 1⅛ in to ⅝ in. according to the spar load. Drag bracing is of single hard round wire graduating in size from No. 8 at the root to No. 14 at the tip.

The wing tip shielding consists of a single ¾ in. 20 gauge steel tube formed to a streamline curve and welded to the spars. Wing ribs are of ¼ in. 24 gauge tubing welded in Pratt truss form. The airfoil section used is the Gottingen 398. The leading edge contour is maintained by 3 ply, 1/16 in. Haskelite top and bottom back to the front spar. Trailing edge of all surfaces is formed of ⅜ in. 20 gauge steel tubing slightly flattened and welded to rib tips. Ailerons of Frize type are constructed of welded steel tubing and mounted to outriggers from the rear spar by three pin hinges. All tubing in the wing and throughout the plane is treated with Lionoil inside and sealed, while the exterior is protected by one coat of red oxide primer and one coat of gray lacquer. Covering is of Flightex Grade A fabric thoroughly doped with Berry Brothers' products.

The fuselage lines are particularly clean because of the narrow cabin and the low position of the engine. No cross bracing obstructs the cabin. The entire fuselage is assembled and welded on a master jig into the customary Warren truss structure and uses no wire bracing. Fairing is accomplished by dural channel members clamped to the tubing. Grade A Flightex fabric doped with Berry Brothers products is used as covering.

Production models are fitted with two large doors on right side of the cabin. Of sheet dural construction and equipped with nickel plated sedan type handles, they provide an unobstructed opening which makes the cabin as easy to enter as is the ordinary closed car. Cabin chairs are of wicker covered steel framework, with tapestry covered cushions, each containing 36 individual coil springs and padded with hair. The floor is of corrugated duralumin while the walls and ceiling are finished in a high grade fabric. Large plate glass windows provide good vision and may be slid open for ventilation. A large baggage compartment in rear of the main cabin is reached through a door on the right side.

A folding front seat makes it easy for the pilot to reach the cockpit through the forward cabin door. An emergency exit is provided by hinged overhead windows. Although the pilot is seated directly in the cabin, the fuselage is so narrow and the engine placed so low that visibility is exceptionally good. While at rest on the ground it is possible for the pilot to see the ground over the engine at a distance of 50 ft., and the landing gear is always in view. Triplex safety glass is used in the sliding panels of the V type windshield, while the large windows of plate glass on either side of the pilot may be completely raised or lowered. Consolidated Type A instrument panel is used, flying instruments being mounted on right, with engine instruments, switches, throttle, and stabilizer adjustment on the left. Altimeter, tachometer, air speed indicator, oil pressure gauge, oil temperature indicator, and navigating lights are standard equipment.

Optional Dual Controls Fitted

All control surfaces are operated by wire cables running over Micarta pulleys. The usual stick is used for aileron and elevator control, but the rudder is operated by rocking pedals hinged at the heel. Optional dual controls of stick and rudder bar type are fitted to the rear seat position in the cabin. Stone navigation lights are standard and Stone landing lights are optional equipment, the two lights complete weighing but 12 lb.

A detachable engine mount makes it practical to use any standard engine of suitable size. A heavy aluminum firewall is built into the forward end of the main cabin. Aluminum cowling of one of the N. A. C. A. designs for radial engines has been fitted and split exhaust manifolds of streamline steel tubing carry the gasses away below the fuselage while permitting the maximum of visibility over the top of the engine.

Two 2½ gal. oil tanks are carried in the engine mount with provision for the expansion of oil. A single 40 gal. gasoline tank in the center section above the main cabin provides gravity feed to the engine. A visible gasoline gauge is installed in the cabin ceiling.

All empennage members are of welded steel tubing. Right and left flippers are individual, each being mounted on three pin hinges. The rudder, of balanced type, is

also mounted on three pin hinges. Stream line wire is used to brace the fin and stabilizer to the fuselage. The stabilizer is of split type adjustable at the forward edge by means of a worm gear operated by a torque rod from the pilot's seat.

Brakes are standard equipment on the spit axle landing gear, which has a tread of 9 ft. 6 in. Streamlined wheels are fitted with 30 x 5 in. tires. Truss Air Spring shock struts extend vertically to a fitting on the forward wing strut, from which point the vertical stresses are carried to the upper fuselage longeron while the lateral landing stresses are carried forward by a strut to the lower longeron, thus leaving the area between the struts unobstructed at the cabin door.

The tail skid is a new development, a tripod arrangement in which the skid itself is non-steerable and non-pivoting, being diagonally braced forward to each lower longeron while a third member, extending up to the tail post, cushions the landing by means of alternate soft and hard rubber disks under compression. This skid has proved most valuable when maneuvering on the ground in cross winds or tail winds.

Factory Has Floor Space of 15,000 *Sq. Ft.*

The present Federal factory at San Bernardino, Calif., with a floor space of 15,000 sq. ft., has a capacity of 10 planes per month. However, a new factory site has been obtained and it is thought that a complete new factory will be in operation within four months, with production at the rate of a plane a day. In the meantime it is said that the Federal CM-3 is being built at the rate of approximately one plane per week.

Line production as laid out in the new factory will take advantage of the welded steel tube construction to speed up fabrication of the planes. Factory organization will be consolidated into three departments: construction department, in which cutting, fitting and welding of the tubing will be done; finishing department, in which cover-

Rear quarter view of the Federal CM-3

ing, doping and painting will be concentrated, and final assembly department. Entire elimination of the woodworking department is expected to speed up production materially.

All steel tubing will be cut to size and stored in bins as it is received at the factory. From these bins it is drawn by workmen who fit the tubing into steel jigs especially designed for quick assembly of materials, easy welding, and rapid removal of the finished part. By heating the entire unit after it has been welded and before removal from the jig, all stresses caused by the welding are eliminated and the part will remain permanently in perfect alignment and be interchangeable with all other parts built in the same jig.

It is said that ribs may be built so much faster with processes which have been developed in the welding department of the Federal factory, that even allowing for higher labor cost of welders over girls used in the fabrication of wood ribs, and higher cost of the chrome molybdenum steel tubing used, the completed ribs cost less than if they were built of wood. After ribs, spars, and compression members have been built up they are placed in a master wing jig platform and permanently welded into a single unit. Purox gas welding equipment is used throughout all welding operations.

Officers of the Federal Aircraft Corporation are: Frank Solt, president; O. R. McNeel, vice president; Fred C. Ayars, secretary; W. O. Harris, treasurer, and Grant Holcomb, Royal H. Mack, Henry Hunold, directors.

National distribution rights are owned by the firm of Bowman & McGrew, Los Angeles, who will market the plane under the factory, distributor, dealer plan and with

Side view of the new Federal CM-3

the trade mark "Wings of Steel." Bowman & McGrew are also Southern California distributors of Stone fog lights and all Stone products.

Charles R. "Dick" Bowman is well known as a veteran Pacific Air Transport pilot, and has a record of 3500 hr. in the air. Charles F. McGrew is a former Chicago business man who now holds a private pilot's license.

Specifications of Federal CM-3 monoplane as supplied to AVIATION by the manufacturers are as follows:

Length overall	25 ft. 9 in.
Height overall	7 ft. 10 in.
Airfoil	Gottingen 398
Span	39 ft. 6 in.
Chord	7 ft.
Wing area	256 sq. ft.
Sweepback	0 deg.
Dihedral	0 deg.
Incidence	0 deg.
Weight empty	1500 lb.
Pay load	500 lb.
Disposable load	930 lb.
Gross weight loaded	2430 lb.
Power plant	Hallett 526, 130 hp. at 1800 r.p.m.
Wing loading	9.5 lb. per sq. ft.
Power loading	18.6 lb. per hp.
High speed	105 m.p.h. at 1850 r.p.m.
Cruising speed	95 m.p.h. at 1600 r.p.m.
Landing speed	35 m.p.h.
Take off in still air	8 sec.
Climb at sea level	750 ft. per min.
Service ceiling	12,000 ft.
Absolute ceiling	15,000 ft.
Gasoline capacity	40 gal.
Range at cruising speed	400 mi.
Endurance at cruising speed	4½ hr.
Cost of plane at factory	$5,800

A 1929 Air Tour?

Some Informative Remarks Regarding the Rules, the Complaints, and the Situation as it Now Stands

By JOHN T. NEVILL

CONSIDERABLE speculation is being indulged in by those of the aircraft industry as to whether there will be another National Air Tour.

Contention that the annual reliability classic for commercial aircraft "has served its purpose, and hence is no longer needed" has been spread about the country. Rumblings of dissatisfaction on the part of some of the pilots participating in the 1928 event have been erroneously amplified to mean that those pilots no longer would consider competing for the Edsel B. Ford trophy. Dozens of other reports relative to both the past and the future of the National Air Tour have landed in various airplane centers of the nation.

Some of these "landings" have been of perfect "three-point" quality, and have remained to be developed into supposed established facts. Others have bounded again into the air from whence they came, only to be "given the gun" and taken to fields more credulous.

Will there be another National Air Tour for the Edsel Ford trophy? Harvey J. Campbell, vice-president and secretary of the Detroit Board of Commerce, sponsor of the Tour, was asked that question point-blank.

"Certainly, we intend to stage another Tour—if the industry wants one," he replied.

"Do you believe that the industry wants another one?" he was asked.

"We believe it so strongly that we are laying a foundation for the next one," Mr. Campbell answered. "Despite the somewhat unfair charges hurled against our organization by several of the disgrunted pilots who took part in the Tour last July, we are convinced that the substantial interests in the industry realize our position. Those interests know that the Detroit Board of Commerce, in going to the expense and trouble of staging a tour of this kind, is sincerely trying to promote aviation as an industry. There is only one reason why an organization such as ours should run air tours, aircraft shows, and other such events, and that is, that we want to make friends with the industry. If the industry, as represented by the aircraft manufacturers, wants another National Air Tour there will be planes entered. If the manufacturers do not enter their planes, there will be no Tour."

Yes or No?

Thus, the question is put squarely up to the manufacturers. Do they see in the continuation of the National Air Tour an opportunity to better realize the objective toward which the Tour aims? Do they see in its continuance further enlightenment of the layman concerning things aeronautical? Do they see in it safer and more pleasantly operated aircraft? Do they see more complete knowledge of what the other fellow is doing? In short, do they see in an annual cross-country competitive flight involving many representative American commercial airplanes, MORE SALES, hence a decided benefit to the industry itself?

With four successfully conducted commercial air tours, each of indisputable benefit to the industry, as a background, the Detroit Board of Commerce has announced its readiness to stage a fifth one.

John P. Wood, winner of the 1928 Tour, publicly stated, following the Tour, that "there is a need for more National Air Tours."

"On the last Tour, we found the public with a far greater knowledge of aeronautics than ever before," he said. "The receptions tendered us, also, were far more spirited."

Although Mr. Wood's views may not be shared by all of the pilots who were in the last Tour, we feel certain they are shared by a large majority of them. And certain it seemed, also, that all of the pilots were not heartily in accord with the spirit of the pilots' petition filed with the Board following the Tour. This petition, discussed in AVIATION in a previous article dealing with its relation to the Air Tour formula, dealt harshly with the Board, to say the least. While prefaced by the statement that the pilots appreciated the spirit with which the Board of Commerce staged the Tour, the petition quickly plunged into a somewhat hostile attitude by requesting "enlightenment on the disposition of funds raised for the Tour."

A Raw Spot Created

Regardless of how it was intended, that paragraph was regarded by those behind the Tour as sufficient evidence that the pilots questioned their integrity. It left a raw spot that was not in the least assuaged by any of the remaining paragraphs.

And these were among the paragraphs that followed:

"We prefer to eliminate the carrying of passengers in the contest, in excess of the mechanic and perhaps one other, who would be suitable in the promotion of aviation.

"We desire the employment of a suitable publicity man, well qualified to handle publicity for the entire Tour.

"We feel the Tour is able to stand on its own legs, and it is our desire to see it incorporated as a separate institution, managed and operated by competent flying personnel, and, at the same time, by men with executive ability. We suggest the formation of a 'National Air Tour Association' to stage the Tour annually."

Undoubtedly the last listed of these is the most important. While the advisability or inadvisability of establishing such an organization will not be discussed here, it can easily be seen that such a move would entail complete reorganization of the Tour management.

The Detroit Board of Commerce, time and again, has stated that it is not averse to having the Tour management taken out of its hands. The Board has assured

the attitude that, since it began the annual Tours, and "started the ball rolling," it is ready to relinquish the "controls" to some one else and receive what credit it already has won. To substantiate the authenticity of that statement, we quote from an editorial written by Mr. Campbell, himself, and published in *The Detroiter,* the official organ of the Detroit Board of Commerce.

"Evidently the manufacturers appreciate what the Tour, which has become a great national aviation institution, has meant to the industry," Mr. Campbell wrote. "There are those who say that it has been the most significant laboratory test that has ever been given to commercial aviation. . . . . .

"The only flaw in the entire Tour was the evidence of temperament among the pilots, which really wasn't so bad. I suppose that it would be much worse to manage a Grand Opera troupe, each trouper considering himself or herself a star and grousing because of someone else getting more favorable press notices, or better hotel rooms. Eighty people were on the Tour and they had to live together for a month. Taking it from broad aspects, they got along splendidly together and many friends were made. . . . . .

"In their petition, they (the pilots) questioned the Tour so far as a Board of Commerce management is concerned. We have said for years, 'If any other organization in the United States has the ability and initiative to run the National Air Tour, we will do everything we possibly can to help them—if we believe it the proper thing to do for the sake of the aviation industry as a whole.' "

Mr. Campbell, in his editorial, stressed the fact that "it was without doubt the most satisfactory and most successful air tour ever held and not a complaint was heard from the manufacturers as to its conduct."

Returning, for the moment, to the pilots' petition we take up the suggestions embodied therein. The pilots would eliminate the carrying of passengers in the contest, "in excess of the mechanic and one other, suitable in promoting aviation." That question has been brought up before, with considerable discussion pro and con. The rules say that, during stick, unstick and speed tests (by means of which the scoring "figure of merit" is computed), the pilot must carry the maximum useful load permitted his plane by the United States Department of Commerce. Under no circumstances shall he exceed that load, but "after the stick, unstick and speed tests have been completed, the entrant may reduce his useful load to 75 per cent. of the maximum allowed by the Department, and will be given credit for 100 per cent. in the formula."

Up to the Pilot

"This load," the rules say further, "may consist of passengers, inert or useless ballast, or both, and must include the weight of the pilot and the weight of gasoline with the tanks full. Tools, spare parts, cockpit covers may be included in the contest when properly sealed and marked."

Although it is stipulated that no contestant shall carry passengers in excess of "the original designed seating arrangements of the plane," no mention is made of the number of passengers, below that number, that may be carried. Whether or not he makes up his required contest load with passengers, or useless ballast, is left to the discretion of the pilot. And that seems to be a very fair disposition of the passenger carrying question.

In drafting the rule governing the carrying of passengers, the Contest Committee of the Board had in mind the idea that passengers who could step from the plane, mingle with the crowd, and talk of the thrills of air touring would leave a far better impression on the spectators than dead weight could ever convey.

A number of the pilots openly resented the carrying of what they termed "too many newspapermen." Their contention was based upon several assertions, namely, that first, the Tour carried far more newspaper representatives than was necessary; second, some of the newspapermen carried knew virtually nothing about aviation, cared less, defeated the purpose of the Tour by "playing up" the minor mishaps, and sent home a number of erroneous "scare head" stories during its progress; third, the newspapermen usually arrived at a leg terminal first, therefore "hogged" the best hotel rooms and other service arranged for the Tour personnel; and fourth, the newspapermen were clearly partial in their stories.

Although AVIATION's representative was fortunate enough to be one of two or three writers, who were excluded from this criticism, a few words in answer to the pilots' claims might be appropriate at this time.

Only Eight Reporters Carried

From our own observation, there can be no doubt some of those charges are partially founded on fact. Others are not. There were eight newspaper and magazine men carried on the Tour. There were 24 competing planes and one or two non-competing planes that flew over a major portion of the 6,300 mi. route. There were approximately 80 men and women in the Tour personnel.

The second part of the pilots' contention is conceded. There were one or two incidents involving at least one of the eight newspaper representatives upon which that assertion is based. It is deplorable that some of the newspapers could not send reporters who, at least, were familiar with aviation "as she is spoke." The third assertion, relative to "hogging" hotel rooms, is not exactly true, since more than half of the newspapermen rode in the Army's tri-engined Fokker, piloted by Lieutenant Frank Tyndall, which virtually always took off last and arrived last.

The fourth contention, relating to partiality, is more or less true about one or two of the "scribes" carried along. But here it must be remembered that a newspaper is chiefly interested in news that will interest its readers. It follows that a newspaper wants to devote more space to the progress of an airplane manufactured in its own city than to the progress of some craft made 1,500 mi. away.

And right here another pertinent thought might be stressed. Fortunately, from aviation's point of view, at least, the last Tour enjoyed excellent weather practically all the way around, and very few mishaps occurred to break the tranquility with which everything was carried out. While that was fine, insofar as demonstrating the reliability of aircraft was concerned, it offered very little to write after one or two stories had been printed. This, of course, pertains to material sent back to newspapers hundreds of miles from the touring planes.

It is difficult to present the newspaperman's side of this problem in a few paragraphs. Better were it an entire article devoted solely to that subject. However, it might be said, that the newspapers and magazines of this country have done nearly as much for aviation as aviation has done for itself. And, although their primary function is to print the news, be it good, bad, or indifferent, they are always ready to lend a helping hand in a constructive undertaking. Neither will space permit further discussion of the remaining suggestions made by the pilots. These, and some radical changes that probably will be made in the Tour rules and management before the 1929 Tour, will be discussed further in a later article.

Selling Aeronautics *to the* Public

By R. E. FISHER

Chairman, Statewide Aviation Committee, California Development Association.

THE various branches of civil aviation in any state will progress toward the goal of public patronage and use, only as rapidly as responsible persons and organizations direct their advance along proper channels. In California aviation has moved forward at a rapid rate. This has not been a mushroom or haphazard growth, however. Both from legal and practical points of view, California's aviation is being directed and coordinated by competent groups.

Soon after the California Development Association, a statewide chamber of commerce, was organized seven years ago it created an aviation department, whose chief purpose has been the promotion of airports, municipal and otherwise. This department through the statewide aviation committee has attempted to exert its influence, founded on the deliberations of its members who represent all sections of the state, on various phases of aviation. The committee has been relatively successful.

Renders All Sorts of Cooperation

The association attempts to harmonize urban and rural points of view and problems. It considers its aeronautical problems just as it studies agricultural questions. It defines its aviation policies from the point of vew of state unity, coordination of all sections, statewide action, legislative policy and political expansion. It accomplishes something along these lines by devoting a considerable part of its annual $300,000 budget toward solving aeronautical problems.

As a first fundamental in aviation, the committee considers air fields the prime requisite. The men who draw this conclusion are intimately connected with the aeronautical industry. They are, Harris M. Hanshue, president of Western Air Express, Inc.; J. L. Maddux, president of Maddux Airlines, Inc.; W. G. Herron of Boeing Airlines, Inc.; Andrew R. Boone, R. E. Fisher, C. R. Graham, E. G. Hughson, Theodore T. Hull, Maj. T. C. Macauley, D. E. McDaneld, Paul Sales, C. Z. Sutton, director of the Oakland airport, C. E. Wilkins and Dr. T. C. Young. Their combined knowledge and experience is applied to a given problem.

The aviation committee supports the Department of Commerce in its efforts to bring to bear uniform regulations. A most recent instance was the indorsement of a proposed air law for California, drawn by the special aeronautical legislation committee, the act also having been indorsed by the Commonwealth Club of San Francisco, the San Francisco chapter, N. A. A., and the general committee of the Railroad Commission. The committee that drafted this law was appointed in October, 1927, it being proposed that the legislation include those points not covered by the Air Commerce Act of 1926. After an exhaustive study, the committee brought in a measure which stresses the desirability of uniformity of control and regulation and provision for equitable and workable enforcement of its provisions. The proposed California law embraces all the essential provisions of Department of Commerce Proposal No. 1. The aviation committee believes that uniform statutes are advisable for obvious reasons. Legislative problems are substantially the same in various states. State sovereignty can be maintained by applying state enforcement to federal rules and regulations. Unharmonious ordinances within a state are advised against.

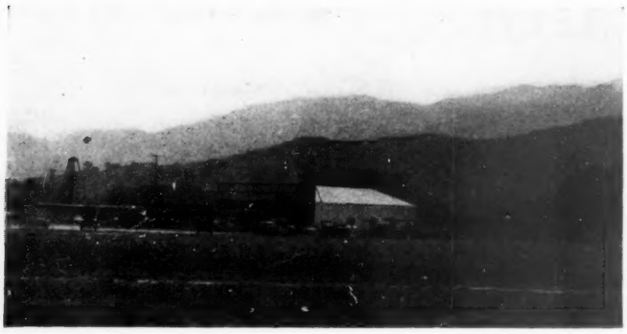
Air view of the Oakland Municipal Airport, Oakland, Cal.

The important sections of the new proposed act provide that it shall be unlawful for any person to operate any aircraft unless he has a federal license and unless that aircraft be licensed and registered by the Department of Commerce; that it shall be unlawful "for any person to operate any air navigation facility in this state unless said air navigation facility is rated by the United States Department of Commerce under the lawful rules of the said department in force Jan. 1, 1929, provided, however, that nothing in this act shall be held to prohibit a person from operating an air navigation facility if said facility is of a type rated by the said department"; that persons must carry and exhibit on demand their various licenses; and that the individual counties shall appoint deputy sheriffs to be in charge of aeronautics. These men shall be clothed with the powers accorded any deputy sheriff, shall be learned in the art of aeronautics and shall be responsible for enforcement of the law. Violations may be punished by a fine of not more than $600 or by imprisonment for

not longer than 90 days in the county jail or both. Also, the burden rests with a defendant to prove he is not amenable to prosecution.

Section 8 concerns public safety in general and is of sufficient import and general national interest to be quoted in whole:

"The public safety requiring and the advantages of uniform regulation making it desirable in the interest of aeronautical progress, it is hereby declared the purpose of



A section of the Glendale Municipal Airport, Glendale, Calif.

this act to make uniform as nearly as possible the laws respecting aircraft, aircraft operators, and air navigation facilities throughout the United States and in furtherance of this purpose it is declared against the policy of this state to permit local legislation respecting, or regulation of aircraft, aircraft operators, or air navigation facilities and all such legislation and regulation is declared to be of general state concern and not municipal affairs, and all municipal legislation and regulation on the subject of aircraft operation, or the operation of air navigation facilities, or the licensing of airmen is hereby declared to be null, void and of no effect, and as to municipalities the state hereby occupies the field of such legislation."

For the benefit of those who would disagree with any of its parts, the section which designates this as "The California Air Navigation Act of 1929," is numbered "13."

The committee's experience in attempting to determine what the states need in the way of air facilities and of coordinating various efforts will be of benefit to other states. We have considered development and improvement of landing fields to be of paramount importance. The efforts of the committee may be classified under five general headings. This may serve as a guide to other states:

1—Development and improvement of landing fields.
   a. Development of landing fields and municipal airports.
   b. Assist in the establishment of adequate emergency landing fields, in the forests.
   c. Conduct a campaign providing for uniform markers of all airports, using as a basis the Department of Commerce marking rules and regulations.

2—Landing Field Directory.
   a. Publish a book, giving accurate data on all first class landing fields in the state.

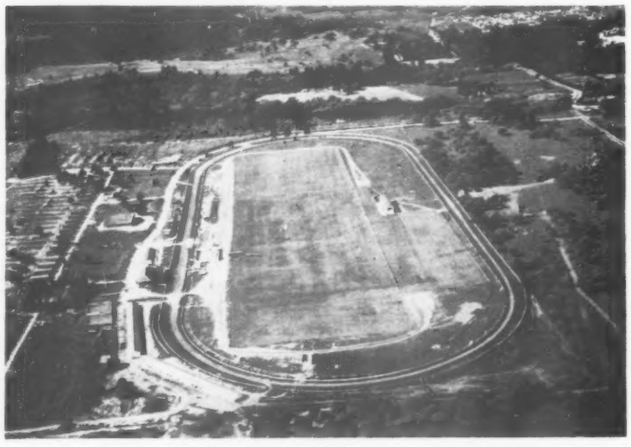
3—Formation of Sound Aviation Laws.
   a. Continue the work of the Special Aeronautical legislative committee in formulating sound laws and assist in having these laws enacted.

4—Development of aviation manufacturing and Related Enterprises.
   a. Assist in the development and maintenance of an adequate weather reporting service in California, including the broadcasting of same.
   b. Conduct a campaign throughout California urging that the name of each town and city be painted on a desirable location which is readily viewed from the air.
   c. Assist the operating lines, both mail and passenger, with air mail and air passenger campaigns.

5—Public Education and Information Service.
   a. Assist in the establishment of an adequate system of aeronautical education in the high schools and colleges of California.
   b. Conduct another Aeronautical Conference and carry out the projects proposed at that time.
   c. Conduct educational campaigns through newspaper and through furnishing of public speakers.

In proceeding with encouragement of landing field facilities, we realize that every municipality wants its airport rated by the Department of Commerce for the prestige such federal recognition brings with it. Many California towns to date have planned two-way fields, with no provision for cross-landings. The Department of Commerce minimum rating calls for 1,320-ft. runways in all directions with clear approaches, or a two-way field with runways 1,800 ft. long and 500 ft. wide, converging at an angle of not less than 60 deg.

No community should plan an airport less than class one as to area, or 160 acres, or 2500 ft. in all directions. If the field is laid out for landing strips, these should be 2,500 ft. long, 500 ft. wide and converge at an angle of not less than 40 deg. In most cases, we have noted, communities plan on too small an area. They may not need more at this time, but a minimum of 160 acres with cross runways to take care of all wind directions are needed.



Air view of flying field and race track at Del Monte, Calif. This is one of California's emergency fields.

Also, each port should be easily accessible from its nearest population center, a feature lacking in too many ports.

In this connection, that port which adds facilities such as telephones and automobiles to its service will find favor with pilots and air passengers. These things add to the general safety and convenience of air travel. Generally speaking, since the Department's regulations are based on considerations of safety, their tenets should be followed.

If a given city has not yet acquired an airport, it should exercise great care in locating it. All land generally is increasing in value. The costs of moving from one site to another will increase materially. Also, proper sites will tend to disappear as populations increase. This is particularly true of the larger cities. It is difficult to estimate how many airports in California are improperly

located. This is a local problem, although state and federal officials will assist communities everywhere to locate their airports. Too frequently, however, I am told, expert advice is disregarded.

In California there are now 108 fields aside from those classed as emergency. Of these, 75 are public ports and fields, 27 private and 6 government. For civil purposes, the government fields are termed emergency or auxiliary fields. At this time our committee is engaged in studying locations for auxiliary forest fields. The term auxiliary or intermediate sounds and looks better than "emergency." It connotes safety, whereas emergency has the opposite suggestion. The Department of Commerce is interested in locating fields every 30 mi. along national airways. The department expects organizations within given states to work toward establishment of fields approximately midway between the 30 mi. fields. This will give an airway with fields every 15 mi., which should aid materially in building up public confidence in air travel.

Suggest State Maps for Passengers

Landing field directories have been published in some states. The only drawback in such a plan lies in the fact that the fields change as rapidly as directories can be printed. We have in mind a substitute plan, a state map for air passengers, noting fields and other points of interest. Such a map will serve not only to inform pilots of landmarks and fields, but aid passengers in enjoying their trips more fully.

Naturally, commercial development will go to those places whose fields are more adequate for the demands of commercial aviation. In California 10 airlines with cabin type airplanes operate. Some of these planes carry 15 passengers each. Such large airplanes cannot land on inadequate fields. Aside from the purely physical aspects of aviation, however, considerable thought should be given to legislative problems. The Department of Commerce studied the various phases of aviation a long while before promulgating its rules and regulations. Its opinion has become expert in its application.

The passage by Congress of the Air Commerce Act of 1926 giving control of civil aeronautics to the Department of Commerce came as the culmination of 14 yr. argument for federal legislation of civil flight. Several bills were introduced in Congress in previous years but failed in passage. Meanwhile several states had passed laws and the rapid growth of post-war aeronautics stirred to activity the American Bar Association and other organizations and individuals in the framing of a bill which resulted in the present act.

Air Regulations Involved

The problem of the regulation of commercial aircraft in the United States is somewhat involved, due to the rights of the individual states and the specific powers of legislation contained in the federal constitution. The Air Commerce Act empowered the Department of Commerce to make regulations pertaining to the qualifications of pilots and planes and enforce them for all aircraft engaged in interstate commerce and to make air traffc rules applicable to all. The individual states still retain their power to regulate aircraft used exclusively within the limits of the state for local purposes, except as to air trafic rules. The tendency is, however, for the legislatures of the several states to enact laws which will conform to the principles of regulations as promulgated by the Department of Commerce. (These are available from the Department.)

By following in general the Department of Commerce recommendations, a given state will find herself in step with her sister states and moving toward popularization of aviation. Once landing fields have been prepared and sound aviation laws enacted, the next step calls for development of aviation enterprises, this to be followed by a campaign of public information.

One of the most important enterprises in California is the weather reporting service, provided by the weather bureau and the Guggenheim Foundation. This furnishes reports several times daily and is available to all transport companies and pilots who have use for it. This service reports weather conditions at various altitudes between San Francisco and Los Angeles.

On the other hand, aviation does not meet its purpose unless people generally are brought to the realization that

The U. S. Navy Air Service base, North Island, San Diego, Calif.

it is at once safe and economical. A fertile field for dissemination of information is the schools. Aviation has not been developed overnight. In 10 yr. or so, present students will be pilots and users of aircraft. Air education in schools and colleges soon will take its important and rightful place. William John Cooper, superintendent of public instruction in California, now has two committees working on proposed aviation courses for public schools. In California approximately six high schools are giving courses in aviation.

As a result of the work of the statewide aviation committee, in order that California might have a sane air law, all the laws in the United States bearing on the general subject were digested and conclusions based on a study of these laws were subjected to all conceivable tests. Now that the act has been approved by some of the most important groups in the state, it will be sent to various chambers of commerce, chapters of the N. A. A., and other groups interested. We believe aviation and its legislation are of and for the people, and unless they give a full measure of interest and support, such laws as this die aborning.

Chambers of commerce in every state can be of great service toward promoting not only their local aviation interests but also those of their state, for without unity in the matters, no state can attain the progress possible through coordinated efforts. The aviation committee of the California Development Association is a clearing house for information and an active leader and participant in various activities. Some communities seek our advice with reference to locating and equipping airports. A similar valuable service could be given by any state chamber of commerce. It is this type of service that stamps a chamber of commerce as progressive and contributes to general progress.

Demagnetization Tests

A Discussion of the N.A.T. Experiments to Determine the Cause of Magnetism Loss Resulting from Booster Operation

By A. H. PACKER

AMONG the myriad service problems which have arisen in keeping planes in condition at the hangars of the National Air Transport in Chicago, is one that does not lend itself to an easy solution. Although not vitally serious it has caused considerable speculation as to its cause. It is the partial demagnetization of one magneto while the other retains its magnetism. And the one that weakens is always the one with which the booster magneto is used.

Taking the evidence at its face value and assuming that the booster magneto was responsible, it was equally evident that it was not near enough to cause any trouble with its own magnets. The primary current of the booster had no chance to interfere with the circuits of the regular magnetos. And that left but one possibility. It must be the secondary current.

Secondary Current Tests Conducted

Secondary current, however, with its very low amperage could not have a magnetizing or demagnetizing effect worth considering—with one possible exception. If there was any way for this secondary current to leak back through the secondary winding of the main magneto, then the combination of low amperage with a high number of turns might have an appreciable effect. On this assumption a number of experiments were conducted.

The regular magnetos were of the inductor type as shown in Fig. 1 and Fig. 2. The booster magneto was one that gave four sparks per revolution, but was geared up so that it gave a shower of sparks while the engine was being started. With the distributor segment rotating to first one spark plug connection and then another, there would be times when this high tension segment would be in between spark plug connections and therefore tending to send showers of sparks through the shortest electrical path to ground. The problem was then to see if by any chance there were times when the path of the least resistance was by way of the secondary winding of the magneto.

This resolved itself into seeing if by any chance the sparks could get from the booster distributor segment on the distributor rotor to the regular segment which is connected to the coil secondary.

This theoretical path is shown in Fig. 2 by arrows. The arrow marked "S" is the vital one in the link of evidence and represents a path which must be completed by a jumping spark or series of sparks, if the reason for the demagnetizing is what it was assumed to be. It was found, however, that the booster magneto was really provided with a safety gap in the regular magneto, as shown in Fig. 1, for the sparks, with distributor blocks

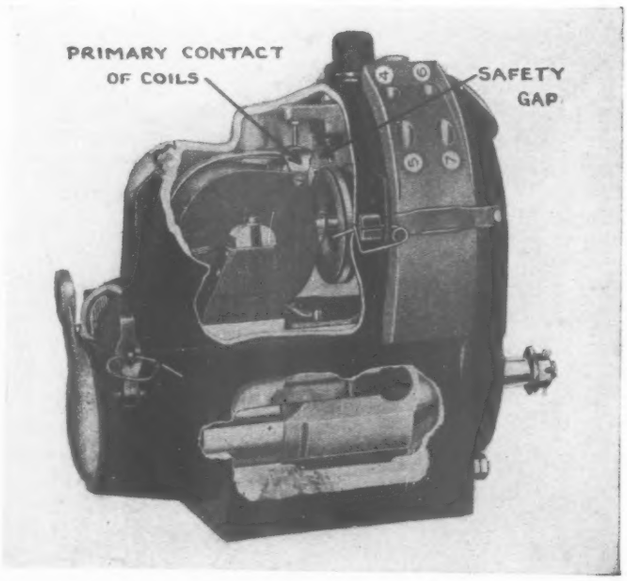


Fig. 1. Phantom view of inductor type magneto showing safety gap utilized by the booster magneto.

removed, would jump to the primary contact rather than jump over the surface of the distributor rotor, from one segment to another.

Another factor was then considered, the nature of which will be understood by referring to the left sketch of Fig. 2. Here the segment that distributes booster current is marked "A" and the one distributing the regular magneto secondary current is marked "B." The spark plug terminal connection nut shown near "B" is marked "C."

Two Optional Paths Possible

With the parts in the relative position shown in this diagram it will be seen that if high tension sparks from "A" can not jump to "B," they may be able to jump to "C," for the distance is less. There, however, they have two options. One is to traverse the spark plug circuit and jump a spark gap which is under compression. The other is to jump across to "B" which is very near "C". "B" at that instant is practically a ground connection, except for the resistance of the secondary winding. The assumption was therefore made that in many positions it would be possible for sparks to return through the secondary of the regular magneto coil.

In proving this assumption as well as it could be proved

with the apparatus available, the distributor blocks were removed and in place of the contact "C," the tip of a screw driver blade of the same width was used. This was held at various positions between "A" and "B" and was found to afford sufficient encouragement to the sparks so that when the booster magneto was operated, the sparks would invariably go from "A" to "B" by means of the intermediate metal of the screw driver blade. And they did this in preference to jumping the ¼ in. safety gap.

Safety Gap Closed to 3/16 In.

The next step in the experiment was to close up the safety gap of Fig. 1 from ¼ in. to 3/16 in. This was found to solve the problem as far as stray demagnetizing sparks were concerned but there was still another test to make. This was to try the operation of the system with spark plugs under 80 lb. compression or more to see if the safety gap was too small for reliable operation.

These tests showed that the proposed correction by means of a smaller safety gap was not one to be immediately put into operation, at least without further testing and experimentation, for it was found that at just about 80 lb. compression the sparks would start to cut out at the plugs under compression and begin to fire at the safety gap. So while one trouble had been apparently corrected, a possibly greater one had been encountered.

The experiences here related are given to show the various circumstancs under which demagnetization can occur as a result of booster operation. But the complete elimination of this demagnetizing action may depend on enlarged distributor construction which permits having greater distances between the segment that distributes booster current and the one that is connected to the magneto secondary.

Reference was not previously made to the fact that the leakage current from the booster would be first magnetizing and then demagnetizing. With the magnets heavily magnetized, however, it is easier to make them lose magnetism than it is to make them stronger. The reversals would accordingly be detrimental rather than neutral or helpful.

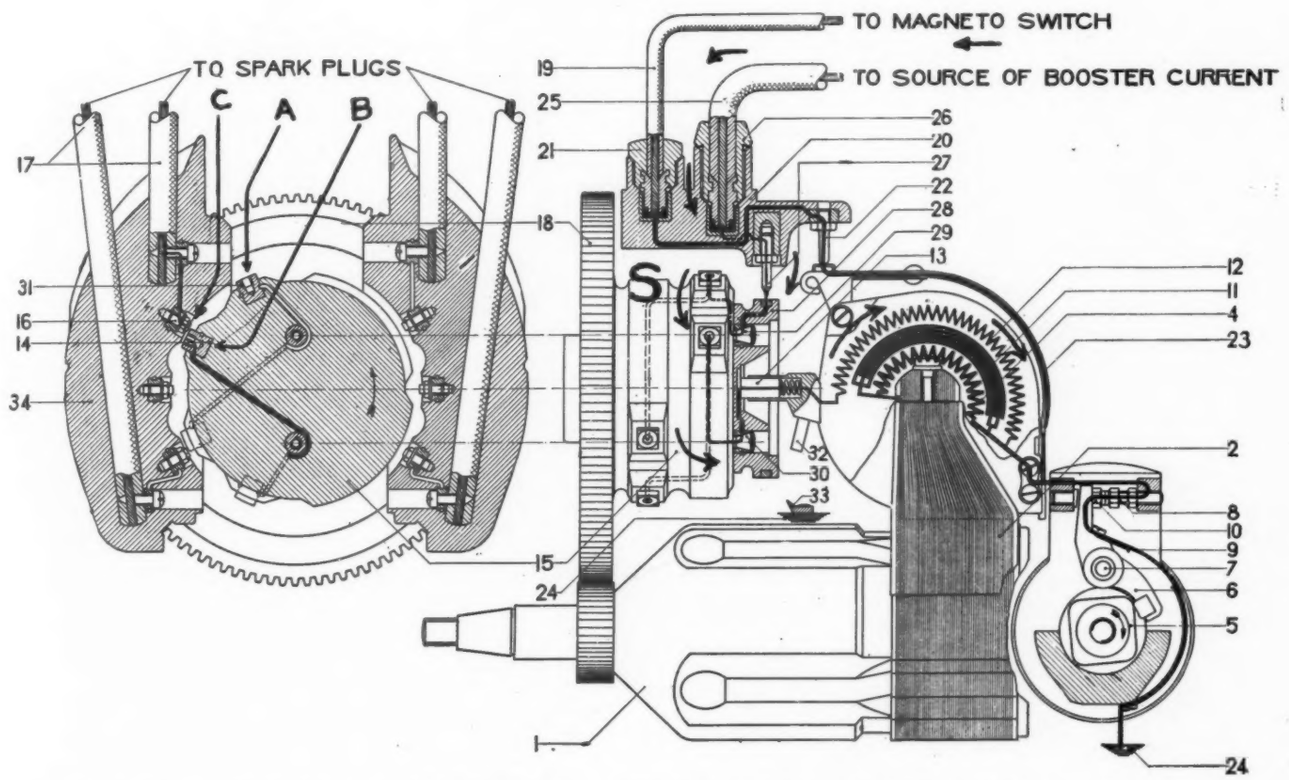


Fig. 2. A diagram of electric and magnetic circuits. Arrows show the probable path of leakage booster current which tends to cause demagnetization.

1 *Rotating magnet*
2 *Pole shoes*
3 *Core of coil*
4 *Primary winding*
5 *Breaker cam*
6 *Breaker lever*
7 *Breaker lever axle*
8 *Long contact point (Insulated)*
9 *Main spring for breaker lever*
10 *Short contact point*
11 *Condenser*
12 *Secondary winding*
13 *High tension carbon brush*
14 *Segment in distributor cylinder carrying seconadry current*
15 *Distributor cylinder*
16 *Electrode in distributor block*
17 *Ignition cable*
18 *Large distributor gear*
19 *Ground wire*
20 *Booster and ground connection block*
21 *Fastening screw for ground wire*
22 *Stud for ground contact*
23 *Primary bridge*
24 *Ground through the magneto and engine*
25 *Booster cable*
26 *Fastening screw for booster wire*
27 *Electrode for booster current*
28 *Collector ring for booster current*
29 *Fastening screw for collector ring (in booster circuit)*
30 *Fastening screw for collector ring (in secondary circuit)*
31 *Segment in distributor cylinder carrying booster current*
32 *Safety gap electrode*
33 *Ground plate for safety gap*
34 *Distributor block*

Air Corps Fokker Exceeds All Sustained Flight Marks

"Question Mark" Remains in Air 150 Hr. and Sets New High Refueling Endurance Record

LOS ANGELES, CALIF.—Setting not only a new high refueling endurance record, but having exceeded all previous records for sustained flight of both lighter-than-aircraft and heavier-than-aircraft, the "Question Mark," the "Whirlwind" powered Fokker transport monoplane of the Army Air Corps, was forced down at the Metropolitan Airport here, Monday, January 7, at 2:07:01 P. M., after having remained in the air for 150 hr., 40 min., 15 sec. To those on the field, it was apparent that a landing might be necessary almost an hour before the wheels of the Fokker touched the ground. The Question Mark had been flying at a height of from 3,000 to 4,000 ft., but it gradually lost altitude and was finally forced to dump its supply of gasoline and to land. This was necessitated because of a partial failure of the engines, which caused the plane to settle.

Attempt to Make Adjustments

The left engine was missing badly AVIATION was reliably informed. The switch was cut, and the mechanic was sent out on the catwalk in an effort to make the necessary adjustments. At the same time, the right engine, which was throwing oil from a yet undetermined source, begin to cut out. The center engine apparently was functioning normally. With the left engine dead and the right one cutting out, the crew found it impossible to remain in the air longer.

Thirty hours before the plane finally landed, it was thought that it might be forced down when the engines seemed to lose their power. This at first was attributed by Army officers in the plane to the fouling of the spark plugs. Inasmuch as the trouble occured at night, however, experts of Wright Aeronautical Corp. believe that the most probable cause of the trouble was the formation of ice in the carbureters as a result of the low temperatures, the fog and clouds which were encountered.

Establish Unprecedented Record

In spite of the fact that the plane was forced down, it must be borne in mind that the three Whirlwinds of the J-5 series, with which the Fokker was powered, have established an unprecedented record. Under ordinary conditions, which permit making minor adjustments from time to time, these engines should operate for a period of 400 hr. between overhauls. The fact that the three Whirlwinds operated continuously for more than 150 hr. without adjustments of any kind is a remarkable record. The flying time of the Question Mark during its endurance test more than exceeds an average month's operating time for the planes and engines used in carrying mail, it is said.

Army officers at the field were overjoyed with the performance of the Fokker. In addition to setting a new refueling endurance record, they agreed that the operation of refueling airplanes in flight has been definitely established as practicable. Aside from the military advantages that will result, the ability to refuel planes in the air will mean much to commercial aviation, they said. In commenting upon this, they cited the points that planes will now be able to make more rapid flights across the country, greater cargoes may be carried, that increased flying hours for both planes and engines may be expected, and that the danger of robbery for planes carrying valuables will be minimized.

One of the refueling contacts made during the record flight.

In its flight, the Question Mark is estimated to have flown approximately 11,000 mi. While it actually maintained a speed of approximately 70 m. p. h., it has been estimated official records of the N. A. A. may show its speed to be only about 17½ m. p. h. This is because the greater portion of the flight was made near the Metropolitan Airport and not over the official course between it and Rockwell Field. Weather conditions and the slight trouble that earlier was experienced with the engines prevented this.

The Question Mark took off on its record breaking flight from the Metropolitan Airport the morning of January 1, with Capt. Ira C. Eaker, well-known cross-country pilot of the Army Air Corps, at the controls. Besides Captain Eaker, the crew consisted of Maj. Carl Spatz, flight commander; Lieut. Elwood R. Quesada and Lieut. Harry A. Halverson, co-pilots; and Staff Sergt. Roy W. Hooe, mechanic.

Less than 100 gal. of gasoline, sufficient for a flight of only about three hours, were in the wing tanks of the Fokker when it took off. As a result, the first of the refueling operations was performed a little less than an hour later over Lankershim, which is near the field. Lieut. Odas Moon, piloting one of the Douglas transports equipped for the purpose, gained a position above the Question Mark, which was flying at an altitude of about 2,800 ft. A 50 ft. hose was let down and 100 gal. of fuel were transferred during the eight minutes that contact was maintained, even though the altitude of both planes was reduced about 800 ft. in seeking better air conditions.

Refuels Over North Island

The second refueling was accomplished over Rockwell Field, North Island, San Diego. On this occasion, in addition to gasoline, the plane received seven five gallon cans of lubricating oil for the engines. A turkey dinner prepared by the women of a church located near the airport, was also taken aboard, so that on the flight north again to Los Angeles the crew ate its New Year's dinner.

The plans for refueling as prepared by Major Spatz called for the delivery of fuel at 8 A. M., 4 P. M., and at midnight. The first night fueling operation was described by Captain Eaker in the log of the plane as being "easy," according to a copy of it that was dropped at the Metropolitan Airport. However, Major Spatz who was handling the hose reported that his face and eyes were showered with gasoline when the hose was released. The result was not serious, but called for the use of the first aid kit carried in the plane. Besides the gasoline and oil, warm food for the crew of the Fokker was transferred regularly at the time of the morning and afternoon contacts.

At 8:45 P. M., the second day of the flight, the Question Mark passed the only

Date Concerning Record Airplane

NEW YORK, N. Y.—Word has been received here that the record breaking "Question Mark" is a standard Army Fokker F-7 powered by three stock Wright J-5 engines. Scintilla magnetos, Zenith carbureters, stock BG spark plugs, and Goodyear tires were employed by the plane. Richfield gasoline and Pennzoil lubricant, furthermore, were used throughout. As for instruments, engine gauge units, flight indicator units, and fueling pump were of Pioneer make.

Gasoline and oil tanks as well as the special apparatus used in the refueling work were all of Government manufacture, according to information supplied by First Lieut. Ray G. Harris, with the Army Air Corps "Question Mark" mission.

previous American refueling endurance record of 37 hr., 15 min., 40 sec., established by Lieuts. Lowell Smith and Paul Richter in August, 1923. The next day the plane broke the record established by two Belgian fliers in June, 1928, when early in the evening, the Fokker had been in the air over 61 hr. Shortly after midnight, it had been in the air 66 hr., 25 min. exceeding the world's endurance record established in July, 1928, by the German pilots, Risticz and Zimmerman, with their Junkers monoplane. The records was not broken, though, for the flight of the Germans was made without refueling.

Having passed all the existing marks for heavier-than-aircraft, the Army fliers set out to beat those set by lighter-than-aircraft. On Sunday morning, January 6, they had accomplished this by passing the 118 hr., 41 min. mark reached unofficially by the dirigible "Dixmude," on the longest flight from the standpoint of endurance ever recorded for lighter-than-aircraft. The Question Mark did not stop at this, and Sunday at 9:26.46 P. M. it had been aloft continuously for 134 hr.

Operators at Boston Form Luncheon Club

BOSTON, MASS.—Representatives of the commercial companies flying at Boston have organized the Boston Commercial Airplane Operators' Association. The association has no officers, no dues, no formal rules except that its members will meet for luncheon and to discuss mutual problems at 1 P. M. the last Wednesday of every month. At each meeting a chairman for the next meeting is elected. It is his duty to notify all members of the next meeting and its place, which he selects, and to prepare an outline of business to come before it.

The first meeting, called by Daniel Rochford, who presided, voted to work to secure the 1930 national air races for Boston, discussed the projected New England air tour in June and the 1929 Boston air show to follow it. Raymond P. Baldwin was chosen to preside at the meeting Wednesday, January 30.

Companies represented in the association are: Skyways, Inc., Curtiss Flying Service of New England, Inc., Boston Airport Corp., Associated Aircraft, Dennison Airport Corp., Old Colony Airways, and Bay State Flying Service.

Two Producers Adopt LeBlonds

KANSAS CITY, MO.—The American Eagle Aircraft Corp. is to make a plane this year powered with the recently approved LeBlond Model 60, five-cylinder engine, it is announced. Inland Sport monoplanes, furthermore, are also to be fitted with this power plant with the early coming of commercial production on this craft.

Open Trade Flight Offices

BIRMINGHAM, ALA.—Offices for the South American Trade Extension Flight are to be opened in the near future in Chicago and New York. These offices will be branches of the Birmingham office and will be under the direction of Robb C. Oertel, and W. O. Browne, at New York, and Orin Welsh, at Chicago.

The South American Trade Extension Flight is being promoted to develop better trade relations between North and South America, Mexico, and Central America. The first leg of the flight is expected to be flown in the latter part of April, according to Donald Beatty, director. A tri-engined type plane is to be used.

Knoll Cabin Biplane Passes Initial Tests

WICHITA, KAN.—Wichita's newest aeronautical product, the four-place convertible Knoll cabin biplane, came through its initial tests successfully. Before an audience of several thousand, including executives of Wichita aircraft factories and many visiting pilots, the Knoll plane was taken aloft by Howard Jones, chief test pilot for the new company. Felix W. A. Knoll designed the plane.

Jones kept the plane in the air nearly a half-hour. Banks, wing over turns, power dives, steep climbs, climbing turns, etc., were made. Before making a landing, Jones took the plane to 4,000 ft. and looped.

The top wing is about 25 ft. in length, the lower about 11 ft. Plywood and fabric both are used in covering. The plane is powered with a Whirlwind engine but is built to take any one of several types of power plants with but a few adjustments. It also can be converted into a sixplace plane.

Knoll designed more than a score of different type craft for foreign governments before coming to America less than a year ago.

San Francisco Plans Meet

SAN FRANCISCO, CALIF.—Plans are being shaped here for the second annual Western Aircraft Show, which probably will take place in late Spring. The success attending the previous showing of aircraft and equipment, races and stunting was of such magnitude that the committee in charge decided an early start would permit arranging for a greater show than that of 1928. While plans are indefinite, a more elaborate display is promised. Airplane races, instead of being routed beyond the vision of visitors to the field, will be around pylons within plain view.

Parks Enrolment Totals 425

ST. LOUIS, MO.—A new high enrolment mark of 425 in the flying and mechanical schools of Parks Air College is reported. Influx of new students on January 1 and 2 brought the increase.

Verville Airplane Tested by Brock

Four Place Air Coach Powered By Warner Seven Cylinder Engine

DETROIT, MICH.—The Verville Aircraft Co. of this city, recently completed the first test flights of its initial product, a four-place cabin monoplane known as the Verville Air Coach. The tests were made by William S. Brock, Detroit-to-Tokio flier, at Ford Airport. Following the test flights Alfred V. Verville, secretary of the company, said his firm planned to produce the plane in quantities for delivery beginning about April 1.

The Verville Air Coach is powered by a seven cylinder, 110 hp., Warner engine, and is designed to fly at a maximum speed of 115 m.p.h., with a cruising range of about 500 mi. The wings are of semi-cantilever construction and have a span of 32 ft. The struts are attached to the cabin through two streamlined stubs that project about 2 ft. out from the side of the cabin to support the undercarriage. The interior of these stubs are utilized as tool and battery boxes.

The stubs also make possible a wide tread undercarriage. Another feature is a novel brake attachment which permits locking the wheels for warming the motor, and doing away with the inconvenience of blocking the wheels.

Added Baggage Space

A combination of silver and red is used in the finish, which accentuates the craft's clean lines. The interior is upholstered in maroon and gray broadcloth and seats four persons comfortably, with added space for baggage.

"In the Air Coach," said Mr. Verville, "we have tried to incorporate some of the pursuit plane's performance characteristics in a compromise permitting the utmost passenger comfort and safety. We have aimed at the passenger comforts of a sedan, restricting the depth and width of the cabin only to meet the demands of good aerodynamic qualities."

The plane will be built for any one of three engines ranging from 110 to 220 hp. Equipped with the smaller engine the Air Coach will sell for approximately $6,500, it was said.

Dynamics Course for Nevada

CARSON CITY, NEV.—At the next semester of the University of Nevada, classes are to be organized for a course of instruction in the theory of aerodynamics. These classes are to be added to those in engineering.

An old DH donated by the Government will be used. Arthur Gay will teach the theory of flying, and Wayne Buerr is to handle the ground course.

TACOMA PUBLIC LIBRARY

Favors $33,578,000 Fund For Air Corps Next Year

Appropriations Body Makes Report to House Providing for 297 New Planes

WASHINGTON, D. C.—The sum of $33,578,683 has been recommended for Army aviation in 1930, in the annual bill sent to the House by the Appropriations Committee. This is $8,730,121 more than the amount for the present year. However, since part of this fund must go to the satisfaction of contracts for 1928 and 1929, the sum of $31,197,429 is left clear for 1930.

The greatest increase in any one item is for production and purchase of new airplanes, their equipment, spare parts and accessories. The amount for this purpose during the present year is $11,837,445, and for 1930 it would be $17,439,280, or an increase of $5,601,835. An item of $7,000,000 is asked for normal operating expenses, ground equipment and runaways. This is an increase of $577,157.

For experimental and research work with airplanes or lighter-than-air craft, including pay of necessary civilian employees, a budget of $2,225,930, $55,930 more than for the present year, is recommended. Another item of $15,000 would be devoted to the development of substitutes for raw materials.

More for Improvements

For improvement of stations, hangars, gas plants for the regular Army and for such other markings, fuel supply stations and temporary shelter as may be necessary, the sum of $3,267,000 is asked, being an increase of $1,530,381.

The bill, furthermore, asks $300,000 for a new site for the engineering division at Wright Field. A decrease of $68,000 is noted in the budget for the procuration of helium, which recommends that $132,000 be set aside for this purpose.

Provisions for Mitchel Field include $280,000 for barracks, $120,000 for non-commissioned officers' quarters, and $131,000 to be divided as follows: hangars, $80,000; photographic building, $36,000; gasoline and oil storage, $10,000; paint and oil warehouse, $5,000. The primary flying school at San Antonio, Tex., is allotted $1,250,000 for officers' quarters and $188,950 for barracks.

Would Authorize Transfers

Technical construction at air corps stations would be provided for with $3,267,000 of the funds, Lighting systems for night flying at several stations would be possible through an item of $140,233. A bill to bring up the officer strength of the corps would authorize the transfer of 200 second lieutenants from the regular army.

In commenting on the large increase in the sum for the purchase and production of planes and parts, the Committee explains that "the large increase for the production of new planes does not mean that a large number of planes will be purchased. The supplemental estimate for 1930, it is understand, will amount to $3,350,000, which will substantially reduce the margin of difference. The increase may be attributed to the purchase of a larger number of the more expensive types of planes, to the abandonment of the Liberty engine for new planes, and to the fact that, for the first time, we will be getting away from contract authorizations and provide all the money as we go."

The program is to purchase 277 planes for the use of the regular Army and the organized reserves and 22 for the National Guard. "Including these proposed purchases," the report continues, "it is estimated that we will be in arrears on the five year program to the extent of 106 planes."

Approve Construction Of Two Gyrocopters

BLUE ASH, O.—Permission to build two gyrocopter airplanes has been granted to Charles E. Lay, aeronautical engineer, Blue Ash, a Cincinnati suburb, by the Aeronautics Branch, Department of Commerce.

Plans for the planes, one of which is to be powered by an 80 hp. and the other by a 50 hp. engine, have been completed by Mr. Lay and Harry Heasel, assistant engineer. The planes are to built in Dayton, O., and Lay anticipates that they will be completed within about two months.

The craft are said to be similar in appearance to the Autogiro craft constructed by Juan de la Cierva. Unlicensed identification numbers have been granted to Mr. Lay, and permanent numbers and operating license are to be applied for upon completion of the planes.

Navy Orders 136 Wasps

HARTFORD, CONN.—The Navy Department has placed a new order with the Pratt & Whitney Aircraft Co. of this city amounting to a contract price of $1,079,782.20. The order calls for 136 Wasp engines and spare parts. The Navy is said to hold two more options.

To Electroplate Full Fuselages

KANSAS CITY, MO.—What is called the largest electroplating vat in the country, to be employed for the electroplating of the entire fuselage of a metal plane in one operation, has just been installed by a Kansas City company, the Bar-Rusto Corporation. The firm recently re-capitalized for $100,000 and moved to a new location at 1808-12 Locust Street.

The electroplating process makes the plane rust proof and eliminates the need for galvanizing. The tank is 30½ ft. long. The plant operates on three eight hour shifts.

Engine Chart Shows Correct Grade of Oil

NEW YORK, N. Y.—"The Gargoyle Mobiloil Chart for Airplane Engines," similar to those pertaining to automobiles, but believed the first for airplanes, has been published by the Vacuum Oil Co. This new chart has been incorporated into the regular lubrication chart work of the company engineers, and, like the other charts, will be revised, added to, and reissued from time to time to keep pace with the changes in engines.

Recommendations for various models of engines made by 18 different companies are included. Mobiloil "D" is the summer and winter recommendation for all Curtiss models with the exception of OX, OXX and OX5, which should use "A" in the winter. Mobiloil "B" is the summer and winter recommendation for all the Wright models as well as the Packard, while "D" is suggested as a year round lubricant for Pratt & Whitney power plants.

Other suggestions include the use of Mobiloil "B" the year round for Brownback, Cameron, Comet, Dayton Bear, Detroit, Fairchild Caminez, Hispano (Wright), Kinner, LeBlond, Super Rhone, Szekely, Velie, and Warner. Mobiloil "D" is recommended for Liberty engines.

May Ban Advertising Balloons

LOS ANGELES, CALIF.—A proposed ordinance now under consideration by the Los Angeles city council would prohibit the flying of advertising balloons within the city limits. Approximately two dozen such balloons are now being operated over Los Angeles by an advertising concern. They are large hydrogen bags which support very large aerial display signs hung on a frame below the balloon and easily read for several miles. These balloons are sometimes flown at altitudes in the vicinity of 1,000 ft. The city council contends that such use of balloons constitute a menace to the operation of aircraft.

Name Williams to Fly Schneider Cup Entry

WASHINGTON, D. C.—Lieut. Alford J. Williams, U.S.N., has been named to represent the United States in the 1929 Schneider cup race, it has been learned here. Aside from the United States, nations entered are Great Britain, France, and Italy, according to press dispatches. It is planned to run the event over the Solent, England, during the summer.

The race, a contest confined to seaplanes, was first held in 1913, and following plans for annual repetition of the event, was again held in 1914. The coming of the war, however, brought abandonment until the revival in 1920. The event was then held yearly, with the single exception of 1924, until the 1927 race, at which time it was decided to hold the contest every two years.

U. S. Twice Victor

Winners of the nine Schneider Trophy contests are Maurice Prevost, France; C. Howard Pixton, England; Lieut. Chevalier Luigi Balogna, Italy; De Briganti, Italy; Capt. Henry Charles Biard, England; Lieut. David Rittenhouse, United States; Lieut. James Doolittle, United States; Major de Bernardi, Italy; and Lieut. S. W. Webster, England.

With its third victory in 1926, Italy took the original Schneider Trophy for permanent possession. Another was offered for competition in the 1927 race.

Ice Warners for Stearmans

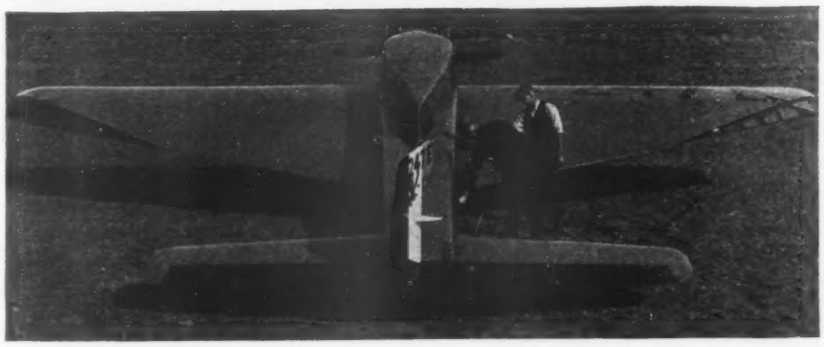
LONG ISLAND CITY, N. Y.—Ice warning instruments of the type developed and shown for the first time at the International Aeronautical Exposition by Moto Meter Co., this city, will be fitted on 11 Stearman mail planes operated by Varney Air Lines, it has been announced by Henry Boynton, head of the aviation division of the instrument manufacturing company. Besides this, National Air Transport has purchased one of the instruments and is conducting tests to determine the value of placing other instruments of the type in its planes.

California Girl Claims An Endurance Record

LOS ANGELES, CALIF.—A new woman's endurance flight record is claimed by Miss Evelyn "Bobbie" Trout, Los Angeles aviatrix, following a flight of 12 hr. and 11 min. made with a LeBlond powered stock model Golden Eagle monoplane. Miss Trout took off from the Los Angeles Metropolitan Airport at 6:26:05 A. M. January 2 and remained aloft until 6:36:17 P. M.

Miss Trout carried 55 gal. of gasoline and four gal. of oil at the start. She had a gallon and a half of gasoline left at the end of the flight and three gallons of oil. The attempt was officially timed by Joe Kikrent, of the National Aeronautical Association, and a barograph was carried in the plane. Application wil be made to the N. A. A. for official recognition.

Test New Type of Plane



Two views of the Hispano powered "Scout" monoplane which was flown recently for the first time at Santa Ana, Calif. This craft has a monocoque fuselage and all wood wing of unique design.

Combine United And Commercial

Los Angeles Firm Purchases Half Interest in Kansas City Concern

KANSAS CITY, MO.—The consolidation of two aircraft companies, involving $1,200,000 has been completed here. The organizations involved are the United Aircraft Corp., of Kansas City and the Commercial Aircraft Corp., of Los Angeles. The Commercial firm purchased a half interest in United in this deal. It is understood $100,000 cash was paid in the consolidation besides the stock consideration.

One of the first acts of the consolidated organizations was the placing of a contract with the Butler Manufacturing Co., of Kansas City for the building of 50 six place biplanes. These are to be built according to specifications worked out by the operative staff of United.

In the consolidation, C. C. Baldwin retires as president of United but retains his directorshop. J. T. Jennings, a lawyer, and Hugh L. Thompson, airplane designer and technical engineer, both of Kansas City, become members of the board. Mr. Thompson also becomes chief of the designing engineers of the United staff and consulting engineer of the Commercial company. The planes for the United will be made here while the planes of the Commercial will be made in Los Angeles. Both lines of planes will be handled by the organizations in each city.

Combined Capital is $1,200,000

The announced capitalization of Commercial is $1,000,000 and that of United $200,000. Officers of Commercial include William M. Griffith, president; Charles R. Francis, vice president; John R. Clow, secretary, Roy S. Younglove, treasurer, and Arthur B. Green, general manager. Directors include Frank P. Comstock, Rodgeley Rea, and J. Ernest Wheatcroft.

One plane, designed by the technical staff of the United company and built here, has been shipped to Los Angeles for test flights. The planes to be produced by the Butler company under contract with United are to be five passenger cabin biplanes. Other types of planes will be built as the company develops, it is said. The plane shipped to Los Angeles was built in the factory of the Standard Steel Works in North Kansas City.

Plan Five Seater for Show

CINCINNATI, O.—With features intended to eliminate much of the engine noise from the passenger cabin, a new five place biplane is now under construction in the International Aircraft Corp. factory at Anchor, O., a suburb of this city. The plane, which is to be powered by a Whirlwind engine, will be exhibited, according to reports, at the New York Aviation Show in February.

To Manufacture Renards in U.S.

Wright-Tuttle, Indianapolis, Gets Belgian Engine Rights

INDIANAPOLIS, IND.—Articles of incorporation have recently been filed for the Wright-Tuttle Aircraft Motors Corp., which has secured exclusive manufacturing and sales rights in the United States, its possessions, Canada, Mexico, and Cuba, for the Renard aircraft engine, now being made in Brussels, Belgium. The new company's manufacturing plant will be located at 25th and Walton Streets, Anderson, Ind., on a three acre site formerly occupied by a rubber company, including a brick, two story factory building with approximately 72,000 sq. ft. of floor space, and a private side trick.

According to Charles E. Tuttle, in describing the Renard engine, it passed the Belgium Government test in June, 1927, with an international rating of 100 hp. at 1,400 rev. It was adopted and is in use by the Belgium Government in its army planes, and is also employed by European sport planes.

Specifications of Engine

This engine, rated at 100-120 hp., has five cylinders. The bore is 4.724, the stroke 5.511, with a piston displacement of 482 cu. in. Double ignition is included, with two Scintilla magnetos. A single carburetor is planned. Full pressure lubrication will be used on a dry pump system, with two oil pumps, one for lubricating and another for scavenging. A special patented distributor mechanism and two valves per cylinder, operated by push rods and patented tappets, are other features.

The complete weight with propeller hub will be 265 lb. The gasoline consumption will be 0.500 lbs. per hp., and the oil consumption is 0.033 lb. per hp. The overall dimensions are an outside diameter of 40 in. and a length of 23½ in.

To Exhibit at Show

Several Renard engines are now expected to arrive from Belgium, and will be exhibited in Anderson and Indianapolis, and probably demonstrated in American planes. The company will also have an exhibit at the New York Aviation Show in February, in Space No. 136, first floor.

Incorporators in the Wright-Tuttle Corp. are Victor I. Wright and C. E. Tuttle of Anderson and Indianapolis, and C. N. Swegger, banker at South Milroy, Ind. Production of Renard engines will begin as soon as organization is complete and the engine has passed required tests in this country. Mr. Tuttle announces that vice-president and chief engineer of the company will be D. J. Deschamps of Antwerp, a well-known engineer and pilot.

Three Companies Formed

NEW YORK, N. Y.—Reports of three new incorporations have been received here. They are as follows: the Breese Aircraft Corp., Portland, Ore., capital stock of $500,000, by M. Schroeder, E. Bell, and others, the company to establish a flying school; The Adcox Schools, Inc., Portland, Ore., capital of $35,000, by Charles F. Stuart and Earl Crossman, also to organize a flying school; and the Arkansas Airplane Cotton Dusting Co., Pine Bluff, Ark., capital of $125,000, by Adrian Williamson of Monticello, and others.

Braley School Starts Expansion Program

WICHITA, KAN.—The Braley School of Flying has launched an expansion program. On New Year's day J. W. Craig, banker and grain man, and a director of the school organization, turned the first sod for an administration building for the school on a 310 acre tract just purchased by the Braleys for a landing field. The tract is north of Travel Air Field. The cost was $50,000.

New buildings planned for the field include a 100 by 150 ft. administration building, a hangar 50 by 300 ft., a dormitory 54 by 250 ft. capable of housing 200 students and containing a cafe for the students, and a factory building for construction of a new type airplane designed by Thomas Braley, the father of Ted Braley, head of the school of flying. The Siedhoff Construction Co. will erect the building.

Locate Lost Sheep from Air

BARLEY, IDA.—Ranchers in this vicinity used an airplane in locating thousands of sheep lost during a recent blinding snowstorm. Brought from Pocatello, the plane was used in a thorough air combing of the Black Pine Mountain slopes. In three days time, herders were directed to all the roving flocks.

All-American Exhibits Entered by 33 Firms

DETROIT, MICH.—Thirty-three airplane manufacturers have entered a total of 64 planes in the second annual All-American Aircraft Show, according to a recent announcement of Ray Cooper, secretary of the Aircraft Bureau, Detroit Board of Commerce, and manager of the show. "In addition," Mr. Cooper said, "43 aircraft accessory manufacturers have reserved a total of 6,370 sq. ft. of floor space, although the show, scheduled for April 6-14, is more than three months off."

Cooper said that applications for entry blanks have been received from 26 accessory manufacturers not on last year's list of exhibitors. Similar applications are at hand from five additional aircraft manufacturers, he said.

Although it has not yet been definitely decided whether the show wil be held in Convention Hall, where it took place last year, or in a completed portion of the $1,000,000 hangar and terminal building proposed for erection on the new municipal airport, Mr. Cooper said that present indications point toward the show being the largest and most complete exposition of its kind ever held in this country.

To Test Furniture Firm Plane

MANITOWOC, WIS.—The Invincible Metal Furniture Company's first plane is expected to be ready for its trial flight by the middle of January. The plane is a cabin type model, three passenger dual control machine, powered by a LeBlond engine. Earl Beach is the designer.

Denies Show Name Change

DETROIT, MICH.—In a recent interview, Ray Cooper, manager of the Detroit aircraft expositions, denied reports that the name of the exhibit had been changed. "It is still the All American Aircraft Show," he stated when interrogated.

Approve Two World Records

NEW YORK, N. Y.—Report is received here that two world air records have been officially approved by the Federation Internationale Aeronautique. They are as follows:

Class C, airplanes with useful load of 2,000 kg. (4,409.24 lb.), for speed over 100 km. course: France, Paillard and Camplan, Le Bourget-Gondreville, Nov. 23, 1926, Bernard T. Monoplane, 600 hp. Hisso—223.546 km. p. h. Previous record: Germany, Hermann Steindorff, Staaken, July 29, 1927, Rohrbach Roland, three 230 hp. BMWs'—216.107 m. p. m.

Light airplanes, third category, single seater, weight empty 200 to 350 kg. inclusive, for distance in a straight line: Czechoslovakia, Capt. A. Vicherek, Prague-Bednodemjanovsk, Russia, Oct. 5, 1928, Avia Monoplane, 60 hp. Walter—2,011 km. Previous record: France, Max Knipping, Le Bourget-Koenigsberg, Oct. 30, 1927, Caudron 109, 40 hp. Salmson—1,400.8 km.

Curtiss Service Buys Boston Airport Corp.

BOSTON, MASS.—Curtiss Flying Service of New England, Inc., has purchased the complete plant, equipment, and good will of the Boston Airport Corp. Negotiations were completed by Robert G. Ervin, vice-president of Curtiss, and Raymond P. Baldwin, president of the Boston Airport Corp.

The Boston Airport Corp. has just signed the first lease for hangar space at the enlarged Boston Airport and been assigned the area next to the city's proposed administration building and nearest the automobile drive which is built on to the field from Maverick Street. Hangar plans are being completed and construction will begin within a few weeks.

The B. A. C. is the oldest operating company at Boston, having been established in the fall of 1925 by Edward P. Warner, now assistant secretary of the Navy, Daniel C. Sayre, and Edward T. O'Toole. It has the local sales agency for Travel Air and Stinson. Equipment includes seven Travel Air biplanes, a Fairchild, two Stinson biplanes, and a Loening. It operates a complete engine overhaul and test plant.

Evans Glider Group Adopts a New Name

DETROIT, MICH.—Official name of the Evans Glider Clubs of America has now been changed to the "National Glider Association," according to a recent announcement of Edward S. Evans, honorary president of the organization and donor of the Evans Gilding Trophy. No change will be made in the fundamental policies of the association; it will continue, on a more extensive scale, to devote its energies to engineless flight.

Rules for local, district and national contests and individual record attempts will be announced by the association after approval by the National Aeronautic Association.

Prof. Peter Altman, head of the department of aeronautics, University of Detroit, has accepted a post on the directorate of the National Glider Association.

Exhibit American Eagle

LOUISVILLE, KY.—A late model American Eagle plane has been placed on permanent display in the show rooms of the Pickrell Motor Co., this city, according to Southern Air College, Buechel, Kentucky distributor of this craft. A city sales and service station is to be maintained by the Pickrell concern.

Named Curtiss Dealer

INDIANAPOLIS, IND.—Shambaugh Airport Corp., LaFayette, Ind., has contracted with Curtiss Flying Service of Indiana to sell Curtiss products in about six counties surrounding LaFayette. This is the first of several dealers being appionted in the state by the Curtiss Service.

Collier Winner Will Be Named

WASHINGTON, D. C.—Through a committee representing the N. A. A., the winner of the Robert J. Collier aeronautic trophy will be announced on January 14, according to Sen. Hiram Bingham, president of the association. This trophy was turned over to the N. A. A. by Robert J. Collier in 1911 to be awarded for the "greatest achievement in America, the value of which has been demonstrated by actual use during the preceding year."

Captain Seymour Gets General Managership

CHICAGO, ILL.—Promotion of Capt. Lester D. Seymour to the position of general manager of National Air Transport, Inc., is announced here by Earle H. Reynolds, president. Captain Seymour was formerly chief engineer and assistant general manager.

The captain entered the service of N. A. T. in the early part of 1926, shortly after its inception and prior to the beginning of actual operations. He first identified himself when he cooperated with the Department of Commerce, Aeronautics Branch, in the establishment and working out the principles of airway aids and navigation, particularly over the Chicago-Fort Worth-Dallas route where night flying equipment was installed.

Captain Seymour is a graduate and holds a degree of Electrical Engineer from the University of Syracuse. During the war he served in France as aircraft maintenance officer of the 85th Aero Squadron, and after the signing of the Armistice, took a post graduate course in the aeronautical engineering at the Ecole Superieure d' Aeronautique in Paris.

Offers Shop Services

LOS ANGELES, CALIF.—Complete service on cowlings, steel tube welding, or Berling magnetos, is now available at the Los Angeles shop of the Aero Corporation of California, according to the announcement of Fred L. Hattoom. The Aero Corporation was recently appointed California distributor for Berling magnetos and carries a full line of parts as well as offering authorized service on them. Men in charge of the three new departments are: Harold Potter, magneto expert; J. E. Goss, steel tube welder; and Ed Gideon, cowling specialist and metal worker.

Announce New Stearman

WICHITA, KAN.—The Stearman Aircraft Co. announces a new type two passenger open cockpit training plane, with 150 hp. Wright engine, to be built during 1929.

Silverwing Becomes Command-Aire Agent

INDIANAPOLIS, IND.—The Silverwing Aircraft Corp. of this city has been appointed distributor for Command-Aire planes in Indiana, Ohio, West Virginia, Kentucky, and Illinois (excluding Chicago territory). The contract calls for 50 planes in 1929. The company will also be dealer for Phylax Automatic Fire Extinguishers, a German product on which Command-Aire has exclusive sales rights in North America.

The Silverwing Aircraft Corp. is a new company recently incorporated by Col. John S. Fishback, president of Fishback Company, local wholesale coffee dealer; Maj. Richard F. Taylor, president of the National Guard Air Service Association and Indiana governor of the N. A. A.; Ulysses Jordan, auditor of Fishback Company; and Lieut. John L. Wamsley, eastern representative of Diamond Chain & Mfg. Co. of this city. Col. Fishback is president, Major Taylor, vice-president; Mr. Jordan, secretary; and Lieutenant Wamsley, treasurer.

Downtown offices of the company are at 802 South Delaware Street, with flying operations and hangar space at Stout Field, Indianapolis. According to Col. Fishback, Silverwing will distribute several other makes of planes, for which it is now negotiating.

Abreu Plane Will Use Detachable Fuselage

ALAMEDA, CALIF.—Under contract with the Abreu Patents Corp. of San Francisco, the Aeronautical Engineering Co. is soon to start the work of constructing the first full-size plane embodying the Abreu detachable fuselage principle. The work is to be done in its plant here and the contract calls for the plane to be flown successfully as an airplane of conventional type and also, with fuselage detached, as a glider.

The Abreu patents, worked out several years ago by J. S. Abreu, a San Francisco cabinet-maker and inventor, embody the idea of dropping engine, fuel and oil tanks, and a portion of the fuselage from the remainder of the plane while it is in the air as a means of combatting fire, extending the glide so a safe landing field may be reached in event of engine failure or otherwise saving plane and passengers in emergency.

Omaha Chamber Plans Course

OMAHA, NEB.—This city's junior chamber of commerce now plans a ground school of 15 weeks' duration. Arrangements for such a school, which will probably begin about the middle of January, have been approved by the junior chamber. It is also the plan to admit other than members of the junior chamber to the classes, which would take the form of a weekly one hour lecture followed by round table discussion.

Personnel

THOMAS E. PELL, for the past 12 years superintendent of the Naval Aircraft Factory at Philadelphia, is now superintendent in charge of production for the Berliner Aircraft Co. of Alexandria, Va., according to announcement by Dabney H. Maury, Jr., president.

J. H. RICHARDS, until recently associated with the American Eagle Aircraft Corp. of Kansas City, has resigned his position there to join a brother at Fort Pierce, Fla., where the two will represent the American Eagle company and start a taxi service and flying school.

JOSEPH V. MAGEE, aeronautical engineer, has been allowed a leave of absence by E. I. du Pont de Nemours & Co. to assist Col. Paul Henderson, vice president of Transcontinental Air Transport, Inc., in the construction work of establishing a combined rail and air passenger route from New York to Los Angeles and San Francisco. He will supervise the installation of hangars, radio, meterological stations, and airway lighting equipment.

DR. W. F. GERHARDT, first graduate of the University of Michigan aeronautical engineering school in 1919 and organizer of the Aeronautical Research Corp., has returned to Detroit from Dayton, O., to take charge of the Curtiss Flying School branch to be operated on Grosse Ile. Dr. Gerhardt and C. V. Burnett, manager of the Curtiss branch at Detroit, have opened offices in the newly-completed Maccabee Building. Operations are to begin about February 1.

RICHARD F. HARDIN has resigned his position as chief engineer for Parks Aircraft, Inc., to become the chief engineer for the Guardian Aircraft Co., according to an announcement made by officials of the Guardian firm, which manufactures a two-seater, low wing monoplane. The change is the result of Mr. Hardin's interest in the light plane field and his belief that a ready market exists for this type of aircraft, the announcement says.

WILLIAM H. CUNYUS, formerly in the Aviation Mechanics School of Great Lakes Training Station, is now associated with the Embry-Riddle Flying School at Cincinnati. Mr. Cunyus is taking charge of the ground school course.

CARL R. ANDERSON of Huntingdon, W. Va., former Ohio State University basketball player, has joined with Embry-Riddle as athletic instructor for students. Mr. Anderson will assist in the traffic department during the winter.

JOSEPH WESTOVER is now operations manager of the Universal Air Lines System Twin Cities-Chicago division, with ROBERT RENTZ his assistant and chief pilot. DELMAR SNYDER has been named dispatcher at Wold-Chamberlin Field, succeeding Thomas Lane, resigned. MARK HURD heads the flying school. A. M. ROBSON is assistant traffic manager for Minneapolis and R. H. MURRAY for St. Paul.

MILTON BARRATT, for the past few years assistant plant superintendent of the Lincoln Telegraph & Telephone Co., has become assistant to the president of the Arrow Aircraft & Motor Corp., of Lincoln, Neb.

LAWRENCE D. HAMMOND has been appointed manager of Wold-Chamberlin Field, the Minneapolis airport. Mr. Hammond was a war pilot and managed an airport in Germany for the Army at the conclusion of hostilities.

E. L. YURAVITCH, coming from the Chicago district, is the new Department of Commerce inspector for Wichita. LEONARD JURDEN, stationed here, will succeed Yuravitch at Chicago. C. A. BRAUKMAN, inspector here for several months, has been assigned to the Denver office, and RICHARD LEES takes his place as inspector for the Kansas-Missouri-Colorado area, with headquarters in Kansas City. LLOYD TULL, former inspector at Wichita, has resigned to re-enter Army service.

Arranging Tour In New England

BOSTON, MASS.—Plans are progressing for a New England good will airplane tour next June to start and end at Boston. The purpose of the tour is to open the summer flying season at the principal flying fields and the route will probably include Providence, Hyannis, Nantucket, New Bedford, Westerly, R. I., New London, New Haven, Bridgeport, Bethany, Hartford, Springfield, Westfield, Pittsfield, North Adams, Bennington, Rutland, White River Junction, Claremont, Concord, Manchester, Portland, Auburn, Augusta, Portsmouth, Lawrence, Lowell, and Boston. Tentative dates are June 6-16. An air show to be held in the new Boston Garden is being considered for June 17-22.

Rush Pen Orders by Plane

LOUISVILLE, KY.—Loaded with a consignment of Parker pens, pencils, and desk sets from the Parker Pen Co., Janesville, Wis., "Parker Duofold," a Fairchild plane, recently arrived at Bowman Field, the municipal airport in Seneca Park. Officials of the company stated that the firm's new Wasp powered plane proved of great value in filling holiday orders wired at the last minute by dealers. Edgar La Parle, with some 3,000 hr. to his credit, is pilot.

Trade Tips

It Has Been Reported That—

—Expenditure of $240,000 for the development of Candler Field to a Class A airport, including construction of hangars, has been approved by the airport committee of the City Council of Atlanta, Ga.

—The Kinner Airplane & Motor Corp. has taken a lease on the former plant of the Doheny Stone Drill Co., at San Francisco Road and Colorado Street, Glendale Calif., and will remodel and add equipment. Installation of an assembly line is planned.

—Immediate construction of a hangar and repair shop is planned by the Nampa Flying Service, Nampa, Ida.

—Transcontinental Air Transport, Inc., is now taking bids on construction of two-story and basement 30 by 84 ft. airport stations. To be of identical design, one will be located at Kansas City, Mo., one at Wichita and one at Dodge City.

The city of Lincoln, Neb., of which Theodore H. Berg is city clerk, is having plans prepared for erection of a garage, to be completed by spring, at the airport, which lies four and one-half miles northwest of Lincoln.

—E. F. Bean, Wisconsin state geologist, has recommended that the legislature be asked to appropriate money for an air map of the state. Mr. Bean is said to have told the state board of public affairs that there is no good map of Wisconsin in existence.

General Aeronautic To Build Sesquiplane

SAN FRANCISCO, CALIF.—Construction of a three-place open susquiplane is to be begun by General Aeronautic Service here, it is announced by Philip Salzman, engineer for the concern. Design of the new plane is practically complete and it is stated all necessary finances have been subscribed.

The plane will have conventional wood and wire wings and welded steel fuselage. All wing spars will be of the full cantilever type. The projected power plant is one of the new series Wright engines.

The concern also will build later a two-place craft for use in student work. This will have full cantilever wings and will be powered with one of the new air-cooled radials of about 100 hp.

Large Order to Consolidated

NEW YORK, N. Y.—Order for 500 complete airplane instrument boards has been received by the Consolidated Instrument Company of America from the American Eagle Aircraft Co., Kansas City, it is reported. Delivery is to be started at once.

AIRPORTS AND AIRLINES

Plan Largest Hangar For Detroit's Airport

DETROIT, MICH.—Mayor John C. Lodge and the Detroit City Council recently formally approved a contract with Louis Kamper, Detroit architect, for work on a $1,000,000 airplane hangar and terminal building, to be constructed on the city's new municipal airport at French and Lynch Roads.

The hangar, which, it is said, will be the largest airport hangar in the world, will be 3,000 ft. long and 100 ft. wide, and constructed in an L shape on one corner of the airport. Each arm of the building is to be 1,500 ft. in length.

An architect's drawing of the structure has been completed, and city engineers already are at work determining levels and foundation requirements. It is hoped that the building will be completed by April 1, in order that it can be used to house the second annual All-American Aircraft Show, to be staged here April 6 to 14.

In that connection the architect showed the Council a letter from one Detroit contractor who stated that, if he was awarded the building contract, he would post a bond for the full value of the structure, guaranteeing its completion within 90 days.

Robertson Line Opening

OMAHA, NEB.—Regular air mail and passenger service on the new Omaha-Kansas City-St. Louis line, Robertson line will start about January 15 according to H. J. McNally of Chicago, general traffic manager of the Universal Air Lines System. McNally said that within six months the Robertson company will also begin a night schedule between Omaha and St. Louis, connecting with Boeing planes which arrive in Omaha shortly after midnight. No passengers are to be carried on the night run.

Appleton Appropriates for Field

APPLETON, WIS.—An appropriation of $2,000 has been made here by the city council for the lease of an airport to serve jointly the cities of Appleton, Neenah and Menasha on the Fox River valley airmail schedule. The site contemplated for the mail airport is that of the present port of the North American Airways company. It is centrally located for the three cities.

Open Harmon Field

SAN JACINTO, CALIF.—Harmon Field, this city, has now been formally opened for operations. The new field is located one-half mile south of San Jacinto in the Hemet Valley: It is in excellent condition.

Open P. A. A. Mail Service From Miami to Porto Rico

Company Also Inaugurating Route to Panama Canal Zone Through Central America

MIAMI, FLA.—With Postmaster General New and Second Assistant Postmaster W. Irving Glover assisting in the ceremony, the first air mail service to link the two Americas was to be officially inaugurated, as we go to press, on January 9 with the first plane leaving here for San Juan, Porto Rico.

This initiatory Pan American Fokker plane, was to take off at 9:15 A.M. Wednesday, arrive at Havana, Cuba, at 11:30 A.M., stop over night in Eastern Cuba, and then continue its flight to Porto Rica the following morning, with a stop at Santo Domingo at 12:30 P.M. and arrive at San Juan at 4:30 P.M. Planes were scheduled to leave each Monday, Wednesday and Friday, with frequency in service increased to a daily schedule as soon as practicable.

Under the contract with Pan American Airways, the Postmaster General may, at any time, demand extension of the service to Port of Spain, Trinidad, via the Leeward and Windward Islands. At Miami the service will make connection with the domestic air mail system.

Semi-Monthly to Canal

Two days after the inauguration of the Miami-San Juan route, Pan American Airways was scheduled to begin operation of a second route out of Miami. This route will run to the Panama Canal Zone, with stops at Merida, Mexico; Belize, British Honduras; Tegucigalpa, Republic of Honduras; Mangua, Nicaragua, and San Juan, Costa Rica. Provision is made under the existing contract for later extension to Colombia, Venezuela, British and Dutch Guiana, and Trinidad. At the present time, this service will only operate semi-monthly, but it also will be increased to daily, as soon as the contractor is able to furnish necessary equipment.

Preliminary arrangements have also been made and are to be carried into effect as soon as landing fields and other details are provided, to continue this service far down the west coast of South America to Santiago, Chile, thence over the Andes to Buenos Aires, Argentina.

Urge Protective Zone For Brainard Airport

HARTFORD, CONN.—In connection with two proposed bills to be introduced at the 1929 General Assembly in Connecticut with respect to Brainard Field and the work of the Hartford Aviation Commission, it has been suggested that a "protective zone" be established around the field, to prevent the erection of unusually high buildings or high smoke stacks that might interfere with the taking off and landing of aircraft.

At present the property surrounding the field is in the light industrial zone, allowing buildings 100 ft. high to be constructed, with no limit to the height of smoke stacks. Already there is one extremely high stack to the north, which is necessarily brightly lighted at night, but forms a hazard at all times.

Plan Improvements for Mills

SAN FRANCISCO, CALIF.—A new east and west runway, 300 ft. wide and 2,000 ft. long, and some $30,000 worth of drainage work are included among the improvement items for Mills Field, San Francisco's municipal airport. The drainage consists of a series of tile laterals, spaced 60 ft. apart, paralleling existing runways. The new runway will be surfaced with a mixture of shale rock and gravel.

New Road for Oakland

OAKLAND, CALIF.—A new short-cut road is under construction from this city to the Oakland Airport and will be ready next summer, according to George N. Randle, city engineer. The highway is to cost $75,000.

Name Two Ports of Entry

WASHINGTON, D. C.—Announcement is made by the Treasury Department that two new airports of entry have been established, these being at Lake Union, near Seattle, Wash., and Ryan Field, San Diego, Calif. The entry designation has been taken from the Bryn Mawr field in the Seattle district.

Expand Service On Coast Route

West Coast Air Transport Starts Daily Portland-San Francisco Schedule

PORTLAND, ORE.—Daily airplane passenger and express service between Portland and San Francisco has been instituted by West Coast Air Transport, subsidiary of Union Air lines. The service has been three times weekly since the inauguration of the line on March 5, 1928. The time of the Portland-Seattle service of the line was changed at the same time to allow continuous passage between Seattle and San Francisco with only a transfer from one plane to another at the Port of Portland airport.

Under the new arrangement one plane leaves Boeing field, Seattle, at 8 A. M. and arrives at the Port of Portland airport a few minutes after 9. Passengers transfer to the San Francisco plane and land at Mills Field about 2:15 P. M.

The northbound plane from San Francisco will arrive at the Port of Portland airport about 2:15 P. M. and the return plane to Seattle will take off immediately.

Operates Baggage Service

West Coast has signed a contract to transport baggage for the United Parcel service. It will maintain at Portland two single engined planes, a Breese cabin monoplane and a Ryan cabin plane for hauling freight on days too rough for passenger flying. The contract was effective January 1.

Al French will be pilot on the Portland-Seattle division, flying the Crusader. The Cascadian and Cherokee will be used on the southern division with Herschel V. Loughlin, W. E. Case, Jack Parshall, and L. G. Goldsmith as pilots. The big planes are tri-engined Back air yachts.

The West Coast has recently inaugurated a sight-seeing service on Sundays, taking any of its planes on a circuit of Mount Hood. On clear days the sightseers can see 10 high peaks—Hood, Three Sisters, Jefferson and McLaughlin in Oregon; St. Helens, Adams, and Rainier in Washington, and Shasta in California.

Air Bureau for Indianapolis

INDIANAPOLIS, IND.—An air travel information bureau is being established here by L. Strauss & Co., Indianapolis clothing store, under the direction of Thomas C. Neidlinger of Strauss' sports department. Plans are for a most complete service to supply information on air conditions, air routes and schedules, air travel costs, advice on aviation, insurance, bookings, etc. The Strauss store carries a complete line of clothing equipment for the pilot and air traveler. The service is to begin about February 1.

Flight Accuracy Assured by Map

MINNEAPOLIS, MINN.—Airplane on the air-rail run of Northwest Airways will hereafter fly on the most accurate schedule possible, planes arriving and departing with train-like consistency, officials of the airways company and Trancontinental Air Transport announce, following the completion of tests on the air route between here and Chicago. A map of the country covered by the planes has been made with marks indicating the approximate time pilots should pass certified landmarks. By use of this the pilots are able to gauge the speed of the plane so that it arrives on schedule.

Detroit-Wayne Field Officers Announced

DETROIT, MICH.—Officers of the newly organized Detroit-Wayne Industrial Airport Association recently were announced as follows: Edward A. Stimson, president; Henry E. Hund, vice-president; William A. Mara, secretary; and Richard Fitz-Gerald, treasurer.

Directors are: James M. Evans, chairman of the board; Frank W. Blair, George E. Buchanan, Harvey J. Campbell, Edward S. Evans, Harry R. Graham, George M. Holley, J. K. Livingstone, William E. Metzger, Newton S. Skillman, and Luther D. Thomas.

Stockholders of the company, composed of Detroit and Wayne, Mich. business men, will operate an airport, one mile square, near Wayne, and about 16 mi. west of Detroit. The field will be purely an industrial airport.

Sponsors New Airport Bill

ALBANY, N. Y.—The first bill introduced in the 1929 legislature was a measure sponsored by Sen. J. Griswold Webb, chairman of the legislative committee for aviation, to permit two or more communities to jointly establish and maintain an airport. This measure, recommended by the New York State Aviation Conference, is expected to result in the establishment of a large number of airports by small communities.

Open New Field at Kansas City

KANSAS CITY, MO.—A second landing field has been started at the Kansas City municipal airport by Matthew S. Murray, director of public works, the new field being located just north of the present one. Grading has been started and it will be seeded down to grass during the winter. Mr. Murray believes that with the two landing fields it will be possible to keep one well sodded at all times.

Curtiss Service Gets Indianapolis Quarters

INDIANAPOLIS, IND.—Curtiss Flying Service of Indiana has leased the first floor of a building at 957 North Meridian Street, in the Indianapolis automobile row for its downtown headquarters. The space will be occupied with offices, classrooms for ground school instruction and mechanics, to begin in January, and for display of plane and engine parts.

Capt. H. Weir Cook, general manager of the Curtiss Indiana unit, also announces an arrangement to use Stout Field, Mars Hill, Indianapolis, which is owned by the Indiana National Guard, for the company's flying operations. The agreement provides that the Curtiss Service may move elsewhere on written 90 day notice to the State, which will permit location of Indianapolis' municipal airport when it is established. Definite arrangements for a flying field were necessary at this time because actual operations of the Curtiss Service are to begin immediately.

It was also necessary to insure a landing field for the Transcontinental Air Transport when it begins its service this spring, and for whom the Curtiss company is business representative in this territory.

Offer Revised Edition Of Book on Hangars

WASHINGTON, D. C.—Prompted by the popularity which greeted the first edition of its bulletin, "Airplane Hangar Construction," the National Lumber Manufacturers Association has prepared a revised and more comprehensive book on this subject.

The new bulletin, based on most recent developments, contains information of genuine value to airport authorities, aviation companies and others who might be interested in airport and hangar construction. The new Department of Commerce regulations for rating airports on "general equipment and facilities" are given. There is also a table of latest plane sizes, an analysis of modern hangar requirements, and new plans of requisite sizes for class A, B, and C airports with details of trusses and hardware.

Need Field for Summer Colony

MARION, MASS.—Residents of this city have asked the American Airports Corp. of New England to prepare estimates on the cost of establishing a modern landing field on a farm site near here, for the benefit of the summer colony.

Bowling Green to Have Field

BOWLING GREEN, KY.—Harry W. Ennis, city engineer of this city, announces that an airport will be established on the Glen Lily road, two miles west of the city.

Prepare Mines Field For Formal Opening

LOS ANGELES, CALIF.—Mines Field here is scheduled to be open to the public within eight weeks, according to a statement by Clifford W. Henderson, director of airports for the city of Los Angeles. The two large hangars under construction are scheduled for completion within six weeks and Henderson said that applications for space already on file will tax them to capacity immediately that the airport is opened.

In connection with a formal opening of the Mines Field airport, Henderson has requested that the City Council officially designate it as "Los Angeles Municipal Sky Harbor." It is thought that this name would have world wide advertising value and would serve to indicate that facilities offered for airships are equivalent to those available to steamships in any good water harbor.

Necessary improvements scheduled for completion prior to the opening are construction of permanent runways, roads, and fences, and the installation of landing lights, ceiling lights, field beacon and incidental field lighting. It is planned to lay 9,000 cu. ft. of crushed granite topped wtih crude oil to provide a permanent east and west runway 100 by 2,000 ft. Other improvements include the construction of 2,000 ft. of fencing and the erection of a public restaurant and also comfort stations.

Report Many Signed To Base at Glendale

GLENDALE, CALIF.—C. A. Spicer, promoter of the Grand Central Air Terminal, has announced that 25 Southern California aircraft operators and manufacturers have signed contracts which call for their location at the field within the next 90 days.

Construction is rapidly nearing completion on the new 130 by 400 ft. all steel hangar being erected at the airport for use of the Maddux Air Lines. Two concrete runways have already been completed and will shortly be in service. The longest runway is approximately 3,000 ft. long at present, and is 150 to 300 ft. in width, being wider at the northern end of the north and south runway, because a south wind usually prevails. A second runway approximately 100 ft. wide has been provided from the northern end of the main runway for approximately 2,000 ft. in a southeast direction to the main hangar.

U. S. - Canada Service Proposed

NEW YORK, N. Y.—According to reports received here, tri-engined, 12 passenger monoplanes, to be built by the Vickers Company of Montreal, Canada, will be operated in passenger service linkink Toronto with the Atlantic seaboard and Mid-West United States. The service is scheduled to start in the Spring.

Map to Replace List of Airports

SAN FRANCISCO, CALIF.—A map showing all California landing fields, with information concerning each, is being prepared by the California Development Association and will shortly be ready for printing. The plan is to give copies of the map to all passengers on the air transport lines.

The map will replace the landing field list formerly printed by the association, which list is now superseded by the Government bulletins on individual landing fields.

Houston-New Orleans Opening Date is Fixed

WASHINGTON, D. C.—Air mail service between New Orleans, La., and Houston, Tex., via Beaumont, Tex., will be started January 23, according to word received here by Postmaster General New from the St. Tammany Gulf Coast Airways, Inc., holders of the recently awarded C. A. M. No. 29.

The schedule, which will give Houston a direct connection to New York, via New Orleans and Atlanta, follows:

Leave Houston, 8:45 A. M.; arrive Beaumont, 9:35 A. M.; arrive New Orleans, 12:30 P. M.; arrive Atlanta, 6:30 P. M.; arrive New York 4:35 A. M.

Leave New York, 9:00 P. M.; leave New Orleans, 11:30 P. M.; arrive Beaumont 2:20 P. M.; arrive Houston 3:15 P. M.

It is understood that pending changes in the Mexican air services will bring the international exchange point from Laredo to Brownsville, according to the plans.

W.A.E. Offering Added Services

Flights Made to Tia Juana and to Site of Boulder Dam Project

LOS ANGELES, CALIF.—Following recent delivery of a new tri-engined F-10 Fokker transport plane to the Western Air Express, Inc., it has been announced that this company will offer several new services.

Regular night flights will be conducted in future from Vail Field, Los Angeles, the 12 passenger monoplane leaving the field at 7:15 P. M., circling the Los Angeles Metropolitan area for 45 min. and returning to the well-lighted field at 8:00 P. M.

A second service consists of regular week-end flights from Los Angeles to Tia Juana, Mexico, the planes leaving Vail Field at 12:30 P. M. on Saturday and Sunday and arriving at Tia Juana at 1:45 P. M. Return flights each day will leave Tia Juana at 4:15 P. M. and arrive at Los Angeles at 5:30 P. M.

Dam Flight Popular

Still another service available by charter arrangement is to be a flight to the Boulder Dam site which is now of the greatest interest to Southern Californians. This flight contemplates a six hour daylight trip passing over Riverside, Banning, Beaumont, and Palm Springs, Calif, reach the Colorado River near Searchlight, Nevada, and continuing from there up the river past the Boulder Dam site. The return trip will be via Las Vegas, Nevada; and Mojave Desert, Death Valley, Barstow, Victorville, Cajon Pass, San Bernardino, San Gabriel Valley, and Vail Field, all of which are in California.

Concrete Runway Endorsed

Showing the Ford Airport concrete runway, which Stanley E. Knauss, Stout Services operations manager, declares has proved of great value, because with weather-softening obviated, good takeoffs with maximum loads are assured.

FOREIGN ACTIVITIES

German Tickets Simple in Form

Purchase of Air Transportation Is Similar to Reserving Pullman Passage

BERLIN, GERMANY—No striking difference between the sale of a ticket for German air transportation, on the Deutsche Luft Hansa, for instance, and the sale of a Pullman ticket in the United States is noticeable—other than that the airplane ticket shows the passenger's name and not the seat number in the plane.

The Deutsche Luft Hansa tickets are divided into three parts, each one bearing the same number; one, the agent's stub, is merely a carbon copy of the other two, and is kept by the ticket seller. The two coupons that are given to the purchaser bear identical information, including price, date, starting point, destination, route, starting time, selling agent's stamp, and service (*i. e.* Deutsche Luft Hansa, Deruluft, Farman, etc.) The first coupon, which is taken up at the starting point, has a blank space for notations by the ticket collector, and the second coupon, to be relinquished upon arrival at destination, has a blank space for notations as to arrival. The conditions of transport are printed on the back.

A more complete summary of these conditions is found in the "General Transport Conditions for Passenger Air Service" which is obtainable at ticket agencies and airport offices upon application.

Insurance for passenger and baggage may also be obtained at these offices. Passengers are forbidden to enter or leave a plane until given permission. Nor are they allowed to open the doors themselves.

Rome Loop Covers 1,373 Mi.

ROME, ITALY—The Rome-Majorca-Barcelona-Genoa-Rome air service which was recently put into operation has a total length of 2,215 kilometers (about 1,373 miles), a report reveals. Two Super-Wal seaplanes are used. Planes take off on Monday simultaneously from Ostia and Barcelona.

French Fliers in Association

PARIS, FRANCE.—National Federation of Aviators of France is the name of the new organization of professional French flyers which has been formed by the association of three groups. Ailes Brisées (Broken Wings), Union of Civilian Pilots, and the Association of Professional Fliers.

Finance Two Fields in Egypt

CAIRO, EGYPT—The necessary credit has been voted for the construction of two large airports in Egypt. One will be at Aomaza, near Heliopolis, 10 mi. from Cairo and the other at Kekhela, in the suburbs of Alexandria. The Ministry of Communications has taken the necessary steps to begin immediately the construction of these airports, but it has decided to construct the airport of Dekhela first, because of the fact that fliers from Europe will first land at Alexandria.

Fokker Planes Sought For Service to Halifax

HALIFAX, CANADA—Negotiations toward the purchase of five Fokker planes, employed by the Department of Marine and Fisheries in the recent Hudson Bay expedition but now stored at the dockyards here, have been opened by Maritime Airways, Ltd.

The corporation, backed by Halifax men, would link this city with the airways of Upper Canada and the United States. It is expected to propose that the city of Halifax establish an airport, upon its agreement to pay rental for 10 years and then take the field off of the city's hands. Also, it is understood that the company will ask the Post Office for the air mail contract out of Halifax, if it gets the Fokker planes.

Lille Will Have Air Port

PARIS, FRANCE.—Funds for an airport at Lille, one of the most important industrial cities of this country and one which suffered most drastically during the war, have been supplied.

English Aero Firm Mergers Announced

LONDON, ENGLAND.—Announcement of two aeronautical mergers of far-reaching interest have been made here recently.

Vickers (Aviation), Ltd., is reported to have acquired the entire stock of Supermarine Works, Ltd., of Southampton, builder of planes which hold a number of important records, prominent among which is that gained in the victory of the Supermarine Napier S-5 in the Schneider cup race at Venice last September.

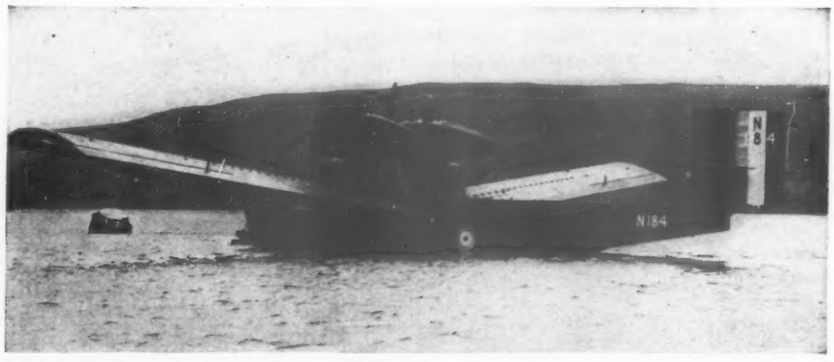
The Supermarine "Sea Lion" won the Schneider cup in 1922, and planes by this company were used in the first foreign long-distance cruise undertaken by the Royal Air Force. J. Byrd, well known English pilot, who was at the head of the Supermarine company, becomes a Vickers director.

The other merger is that of the A. V. Roe Co. of Manchester with the Siddeley construction group.

Rome Field Well Equipped

ROME, ITALY.—The "Littorio" airport here is one of the most completely equipped in the world, according to Consul Leon Dominion. The project, promoted by Count Giovanni Bonmartini, general manager of the Compagnie Nazionale Aeronautica (National Aeronautical Co.), which owns and operates the local landing field, includes a total of 296 acres. The location of this airport permits landing for both land and seaplanes. For its construction the Italian Government is reported to have contributed the sum of 2,000,000 lire ($105,260), the Municipality of Rome a similar amount, and the balance of the total cost of 20,000,000 lire ($1,052,000) was furnished by the local company.

New Beardmore Metal Plane



Latest of the British flying boats—the all metal Napier Lion powered Beardmore "Inverness." Some similarity in design to the huge "Inflexible" may be noted.

THE BUYER'S LOG BOOK

Novalux No. 3 Floodlight

AN AIRPORT floodlight, in which circular lenses and mirrors are entirely eliminated, has been developed by the General Electric Co. and is now included in its line of aeronautical products. The Novalux No. 3 projector contains 14 high power incandescent lamps providing a total of approximately 3,000,000 cp. These lamps are arranged in a row in front of six cylindrical mirrors, which spread the light over the field in such a way that it does not rise high enough to interfere with the vision of pilots landing directly into the beam. The beam divergence is 160 deg. horizontally and 3 deg. vertically and provision is made to adjust the reflectors.

Specially designed 1,500 watt, 32 volt incandescent lamps, tubular in shape and gas filled, are used producing a total load of 21 kw. Tungsten filaments, relatively thick and tightly coiled to concentrate the light source are employed. Filaments are prefocused, it being essential that the light sources be at the foci of the mirrors to obtain a narrow parallel beam. The mirrors, which are 36 in. high and 15 in. wide, are of special optical glass, accurately ground, parabolic in the vertical direction and

A photograph of the Novalux No. 3 Airport Floodlight manufactured by the General Electric Co.

plane in the horizontal. This accounts for the wide variation in horizontal and vertical beam divergence. The silver reflecting surface on the back of each mirror is heavily coated.

In the rear of the floodlight housing there are six capped openings to permit adjustment of the mirrors to fit local contour conditions. The lamps are provided with louvres to prevent direct light from escaping upward at the front, and similar but larger louvres attached to the sides prevent direct light from reaching upward in those directions.

The incandescent lamps and reflectors are mounted on a rigid, welded pipe structure, independent of and extending through the housing. This structure is secured to posts, so that vibrations of the housing do not affect the light beam. The housing is of fabricated steel, about 8 ft. high, 10 ft. wide and 4 ft. deep, and is airy, light and dust tight. It is so designed that convection currents carry the heat from the incandescent lamps to the housing, where it is rapidly dissipated. While not intended as a portable device, the floodlight is mounted at the middle on removable wheels to facilitate movement.

The front of the unit consists of three rectagular panes, each containing three strips of plane, heat-resisting glass. The middle panel is parallel to the line of lamps; the other two are at angles so as to facilitate diffusion of the beam in the horizontal direction.

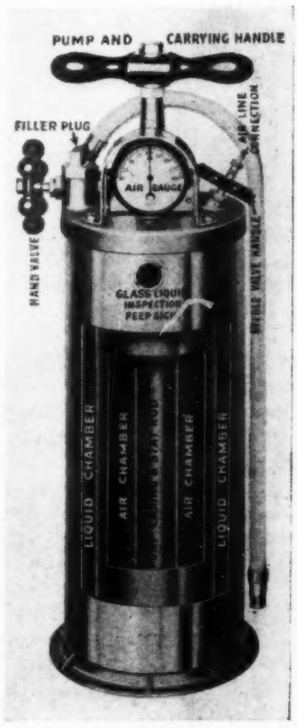
Among the advantages claimed for this new design are uniform distribution of light and higher intensity of illumination per kilowatt input.

Phister Fire Extinguishers

PHISTER MAINTAINED air pressure fire extinguishers are made in 1, 3 and 10 gal. capacities and each can easily be operated by one person because no pumping is necessary. Simply open the valve and direct the steam just as you would a hose line These products are made by the Phister Manufacturing Co., 901-903 Broadway, Cincinnati, O.

Phister Fire Extinguishers are constructed entirely of brass. The top and bottom are heavy brass castings, to which are securely fastened an inner and outer brass shell forming two chambers. The outer chamber contains extinguishing liquid and the inner chamber contains air under pressure which, when released into the outer chamber, forces the liquid in a continuous stream out through the hose a distance of 35 to 40 ft.

A high efficiency pump extends through the top casting and is securely fastened to the bottom casting. This pump is only used to replace air pressure after the extinguisher has been used. In addition to the pump, the extinguishers are also equipped with a regular automobile tire valve, which makes it possible to restore the pressure from an air line. Corrosion of vital parts is entirely eliminated in the Phister fire extinguishers because the moving parts are entirely removed from the liquid.



Showing construction of fire extinguisher

The Phister No. 1 is a portable Carbon Tetrachloride extinguisher of 1 gal. capacity. It can easily be handled and operated by one person. The weight fully charged is 31½ lb,. and the shipping weight is 40 lb. The Phister No. 3 is identical in construction and operation to the No. 1 except that its capacity is 3 gal. of Carbon Tetrachloride. It is equipped with two carrying handles.

The Phister No. 10 has a capacity of 10 gal. of Carbon Tetrachloride and is mounted on wheels. Otherwise it is identical in construction and operation to both the No. 1 and No. 3. This model weighs 455 lb. fully charged. The shipping weight is 610 lb.

Orange Steel Hangars

THREE GENERAL types of airplane hangars are now being offered by the Orange Car and Steel Co., Orange, Tex. Each of these types embraces several sizes resulting in a line covering a wide range of requirements. The company furnishes complete erection plans with each hangar and is also prepared to provide for foundation work and complete erection when this method is desired.

Orange hangars are built on frames made up of steel angles and shapes and roof trusses are shop riveted in sections of convenient size for transportation. As all connections made on the field are bolted, these hangars can be removed from one location to another without loss. All framing is painted before shipment. Heavy gauge galvanized copper bearing corrugated sheets are used for roofing and siding, these sheets being fastened directly to steel girts and purlins without the use of wooden nailing strips.

Standard factory type steel sash with ventilating sections are used as windows. Clear or factory ribbed glass may be used, glazed with clips and steel sash putty.

Main doors are of the vertical lift type of steel construction throughout and mounted on ball bearings. These doors open overhead and, in open position, afford canopy shelter across the hangars. They are of continuous section and require no additional ground space. They are operated by hand chains and can be opened or closed in one and one-half minute.

The Type B Orange hangar is designed for large airports and is available with door openings ranging from 36 x 10 ft., 6 in. to 80 x 18 ft. and in lengths from 40 to 60 ft. Longer lengths in multiples of 20 ft. also can be provided. This hangar has an arched roof with moulded trim and can be furnished with doors at both ends when desired. A 12 x 8 ft. sliding door is also optional for one or both ends.

The type A hangar is a "T" shaped building intended for individual storage and can be provided in any capacity by the addition of units to the original structure. The five sizes range from 36 ft. to 80 ft. clear span openings. The Type M, which is provided with openings in the same range of sizes, is a gable roofed model and can be furnished with openings at both ends if desired. Standard lengths of 40 and 60 ft. are provided in the five ranges of sizes of the Type M hangar but any greater length in multiples of 20 ft. also can be furnished. A 12 x 8 ft. sliding door is also optional for one or both ends.

Adapto Chair

INCLUDED IN the products of the Adapto Chair Co., 413-417 East 36th St., New York City, is a self adjusting reclining seat designed especially for airplanes engaged in transport service. The Adapto chair is simple in design and has no springs nor complicated mechanism to get out of order. It is available in duralumin or wicker canstruction.

The Adapto chairs can be furnished with any standard upholstery and in colors to harmonize with any cabin interior. The back is pivoted to the framework and the seat is hinged to the back. The pivot point is so located that a slight increase in pressure on the back will cause the seat to move forward slightly and the weight of the occupant prevents the back from going too far.

An unlimited number of positions is made possible by the design of this chair with the limiting position being that of chaise longue. The device is so balanced that it will retain any desired position. These chairs are made in sizes to meet the demands of any airplane manufacturer.

SIDE SLIPS

By ROBERT R. OSBORN

Mr. R. S. F. of Concord, N. H., sends in an interesting clipping from the Boston *Post* describing an accident to an airplane " of the old Jenny Lind type." Apparently the reporter has soloed a few hours in Jennies and knowing them for the temperamental prima donnas they are, subconsciously wrote what he was thinking. The intrepid Aviator was quite pleased when he read this item as he had always been searching for a flossy name for his Jenny. He immediately went out to the field and with appropriate flourish and ceremony christened it the "Spirit of the Swedish Nightingale."

* * *

Mr. C. H. C., of Cambridge, Mass., or pardon us, we forget that we should write Prof. C. H. C., apparently reads the Boston *Post* also, as he sends in a clipping from an article appearing therein:

"No, there is nothing when one is humming along, at what to the novice gives the impression of wild speed, that is really unpleasant. For one thing the engine holds a much more even rhythm. The bumps come softer and fewer due to the quick traversing of the air pockets, and the center of gravity like that in the drop from a parachute is so evenly distributed that the sensation is much the same."

We agree with Professor C. that this business of evenly distributing one's center of gravity might be a quite unpleasant sensation, even at high speed.

* * *

Of all of the haywire "aviation" stories which have flooded the newspapers and magazine lately, we think the prize story for 1928 is unquestionably the one sent in by W. W. K. of Kane, Pa. It is, as follows:

"But the seriousness of his errand was lightened by a comic touch. Before Dick took off on his long flight, he had snatched a piece of bread which he had buttered well, and after wrapping in waxed paper had placed in his pocket. Becoming hungry after several hours of rarefied air flying be unwrapped his scanty meal. Just as he raised it to his mouth, however, a terriffic blast of air tore it from his hand and it fell butter side down on the lower wing, where it stuck fast. Dick regarded it greedily and with chagrin. Finally an idea flashed upon him. He would eat yet. Loosening his safety belt, the daring aviator prepared to climb out on the wing for his meal. Carefully setting the stabilizer so the plane would not dive, he made a left vertical to counterbalance his weight while on the right wing. Then leaping adroitly out of the cockpit he snatched the none too clean bread and bounded back to his seat. And none too soon! The plane was badly out of balance, as crossing air currents tossed it to and fro. Not being able to fall forward on account of the position of the stabilizer, the ship was preparing to go into the dreaded tail spin. Like lightning Dick's practiced hand siezed the controls. He threw the stick forward to stall the spin while his frenzied feet sought the rudder. Madly he kicked it back and forth until he worked the plane back to an even keel. Then with a sigh of relief he settled back to enjoy his hard earned lunch."

When the World's Crack Trains are too Slow!

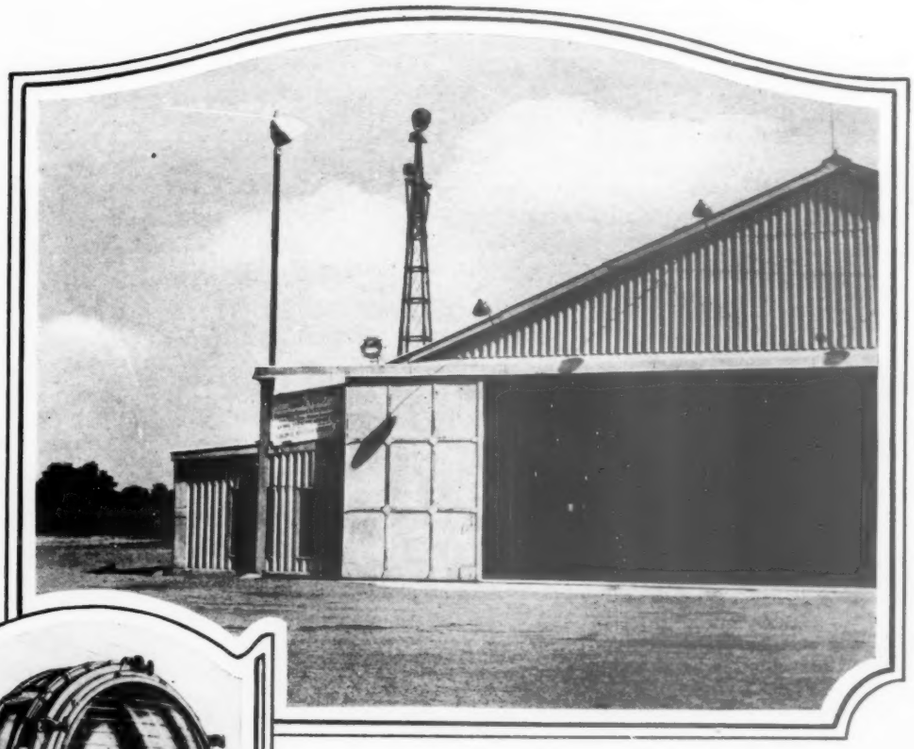
Northwest Airways, Incorporated, in connection with three of the great western railroads, have selected Pratt & Whitney powered equipment to carry on the first air-rail route.

By the use of Ford tri-motor and Hamilton single-engine planes, now in daily operation between Chicago and St. Paul and Minneapolis, a full business day is saved the traveller on his trip to the East or West Coast.

Passengers have the assurance on this line that the Pratt & Whitney engines behind which they ride embody the finest in modern design and workmanship — engines with an international reputation for dependability.

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

A *New* 24-inch Revolving Beacon



THIS new revolving beacon was built by the Crouse-Hinds Company to meet the requirements of the United States Department of Commerce and is the government standard for use on airways.

The barrel, base and trunnion arms are of cast aluminum silicon alloy.

Zenith lights which use the spill light of the lamp enable an aviator to locate the beacon after he has passed out of range of the main beam.

A rugged and dependable lamp changer is also provided.

Before purchasing a beacon, be sure to see this latest government standard.

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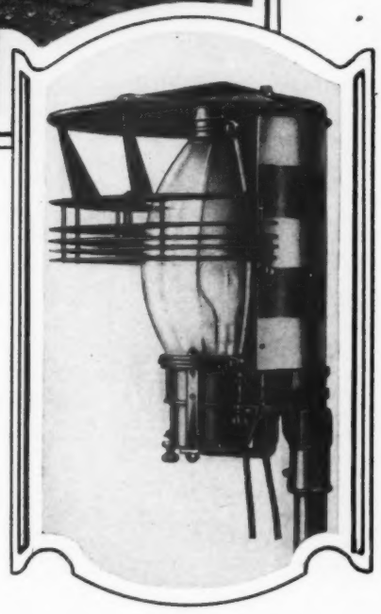

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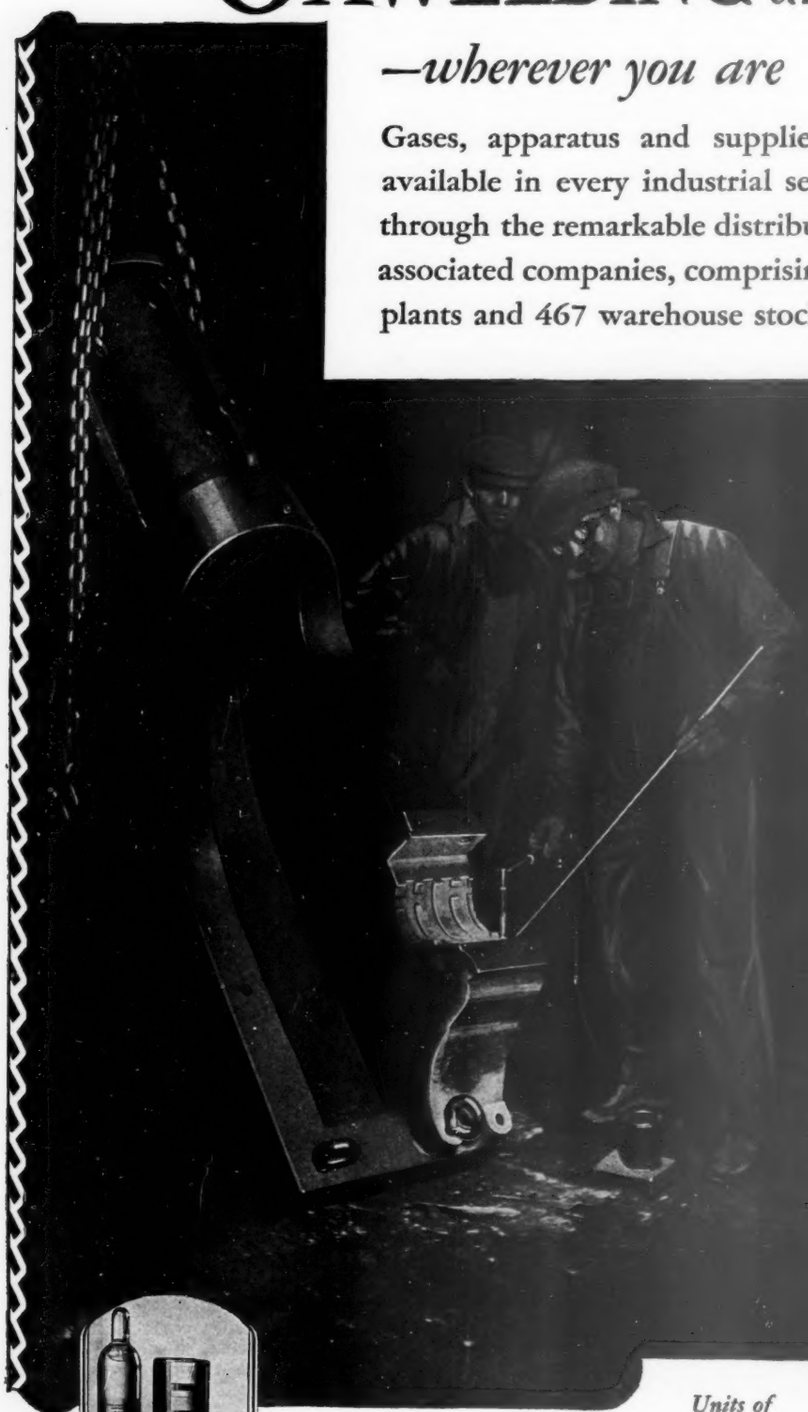

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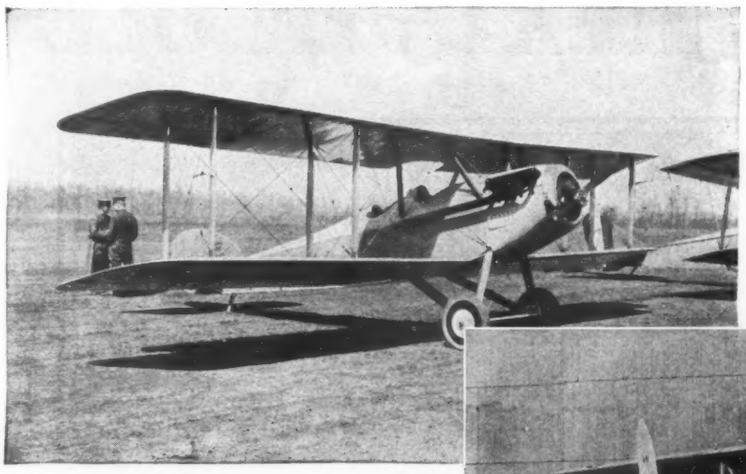
1917-1929



Above

1918—The VE-7

the first product of the Vought Organization. Winner of the War-Time Advanced Training Plane Competition.

Below

1929-02U-2 CORSAIR

Five-purpose plane. Powered with a Pratt & Whitney "Wasp" 425 H.P. engine.

IN 1917, the Chance Vought Organization was commissioned by the U. S. Army Air Service to design and build a modern two-seater—with pursuit performance—for advanced training.

This plane was produced and delivered on the field for tests in the short space of three months.

In open competition against the aircraft industry, this plane won the Army Competition held to select the best advanced-training plane producible. In fact, the official verdict was, "Easily the best."

In 1927, after ten years of service to the U. S. Army and Navy Departments, the Chance Vought Organization was honored with one of the largest orders ever placed for any single new model plane. The U. S. Navy Air Service ordered seventy Chance Vought Corsairs to be built and delivered.

1929—Today the Vought Corsair is the official plane of practically every ranking officer in the U. S. Naval Air Service.

Vought Plane Flying Hours

For the fiscal year 1928 in U. S. Navy—29,371 hours, or approximately 3,522,000 miles—twice that done by planes of any other manufacturer.

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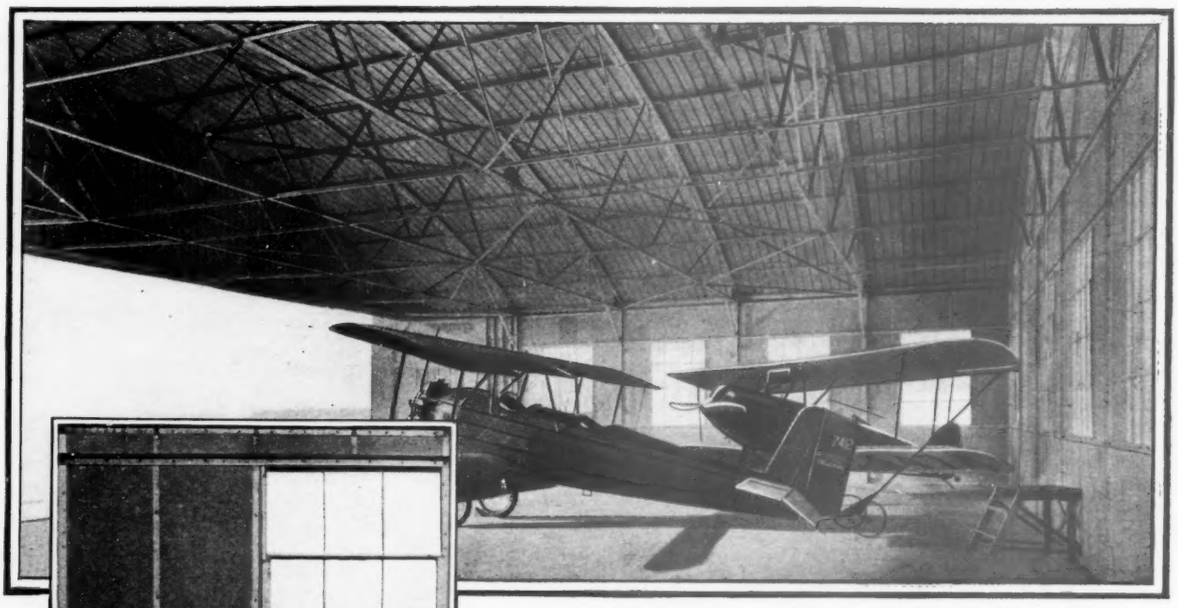

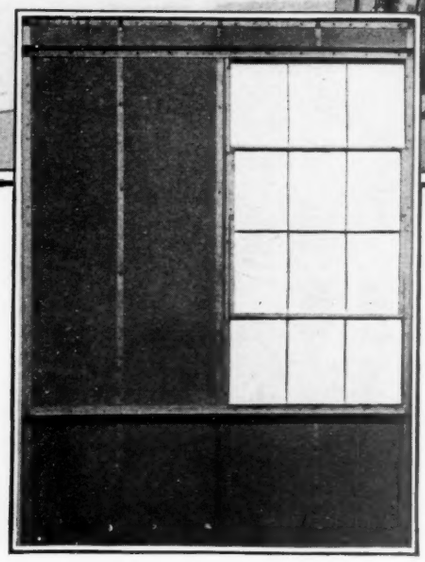

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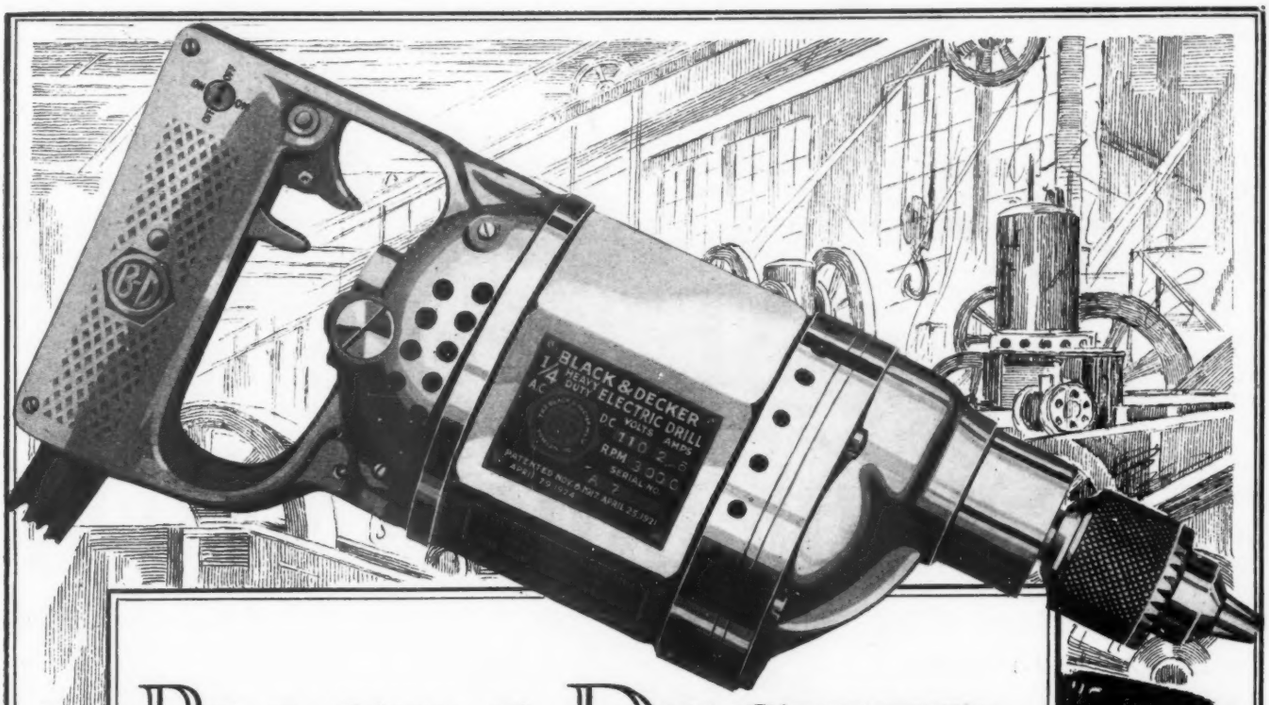

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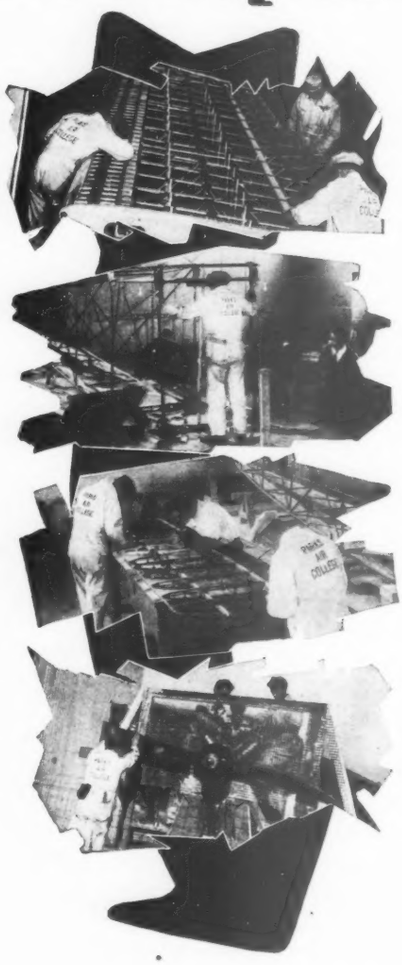
No wonder salaries are high! No wonder experienced, thoroughly trained airplane experts have no difficulty in finding good jobs at high pay and receive fast advancement.

And now Parks Aircraft, Inc., the new $2,000,000 *Manufacturing Corporation agrees to give every man who enrolls in the Airplane and Engine Mechanics Course during January a job in the plant, in turn, upon graduation!*

There are no strings to this offer except that you reach school in January! The first $175,000 unit of the Parks plant is up—the first ships are in the air! But men are needed—badly—or production cannot go on!

Get into this fascinating profitable industry. Get yourself a position that leads to salaries of $300 to $500 per month—and leads upward to salaries of $6,000 to $25,000 per year as superintendent, production man, factory executive or transport engineer!



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On February first tuition for the Airplane and Engine Mechanics Course goes up! And only if you enroll during January can we definitely offer you a job, so catch the next train for St. Louis! Sieze your opportunity. If you want additional details wire for a free copy of "The Man Who Tunes the Plane," our Mechanics School catalog, that gives you full particulars of the course, and shows photos of students learning to build and service airplanes and engines. Wire or rush the coupon today!

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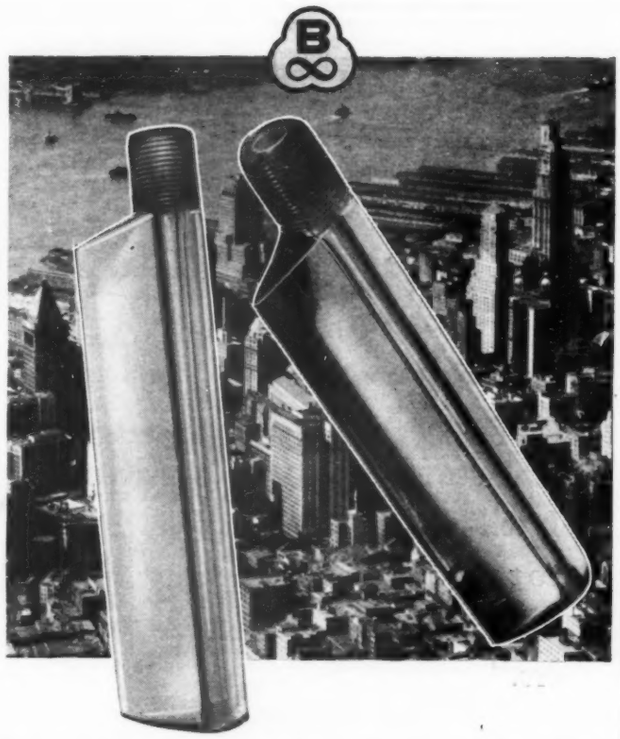

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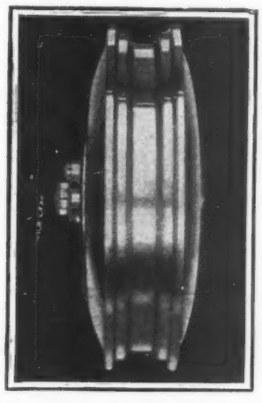

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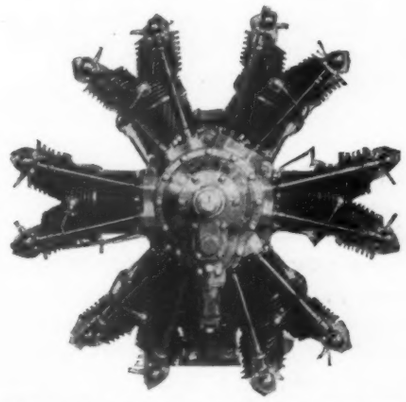

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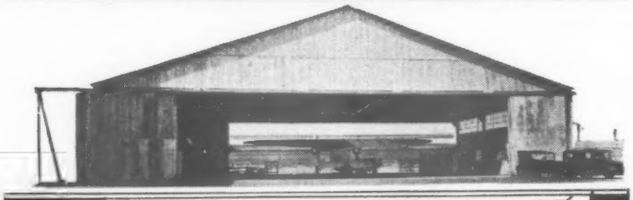

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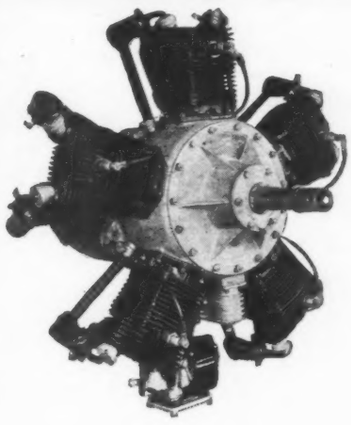

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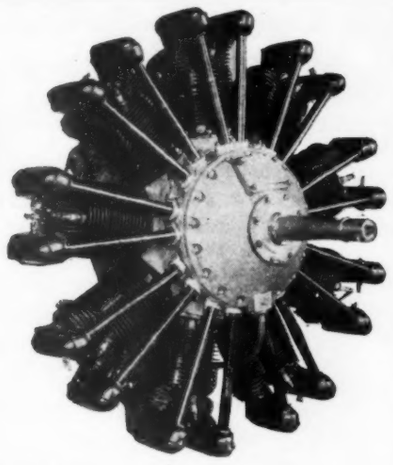

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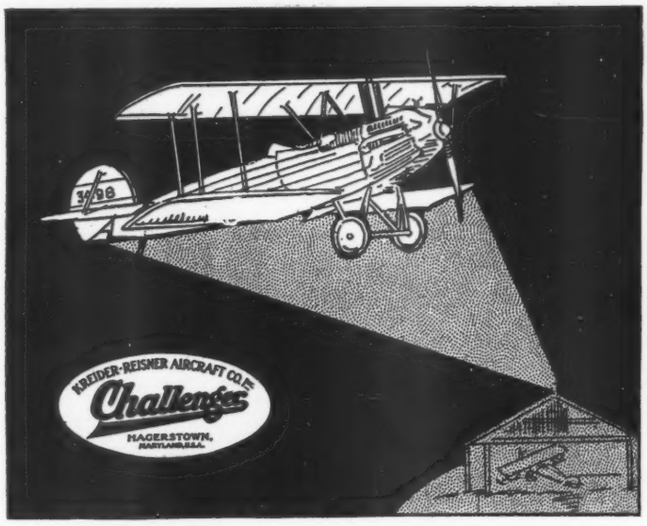

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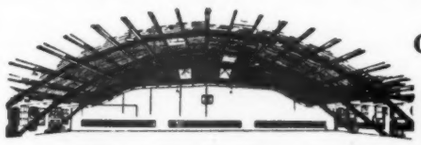

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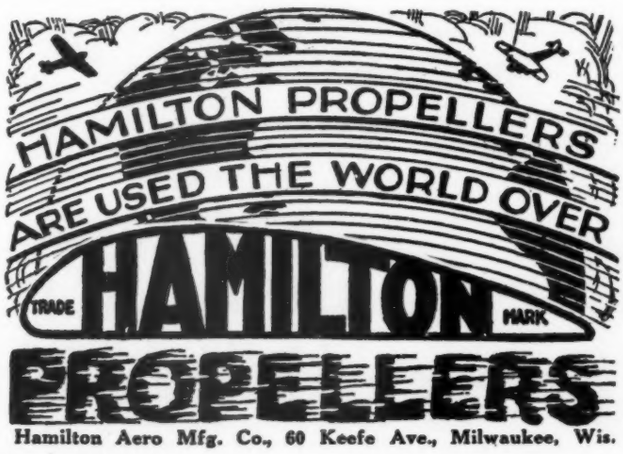

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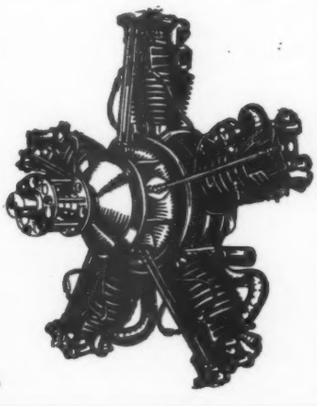

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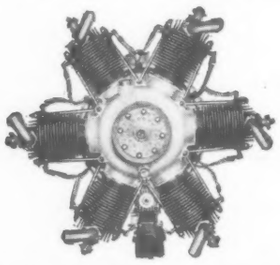

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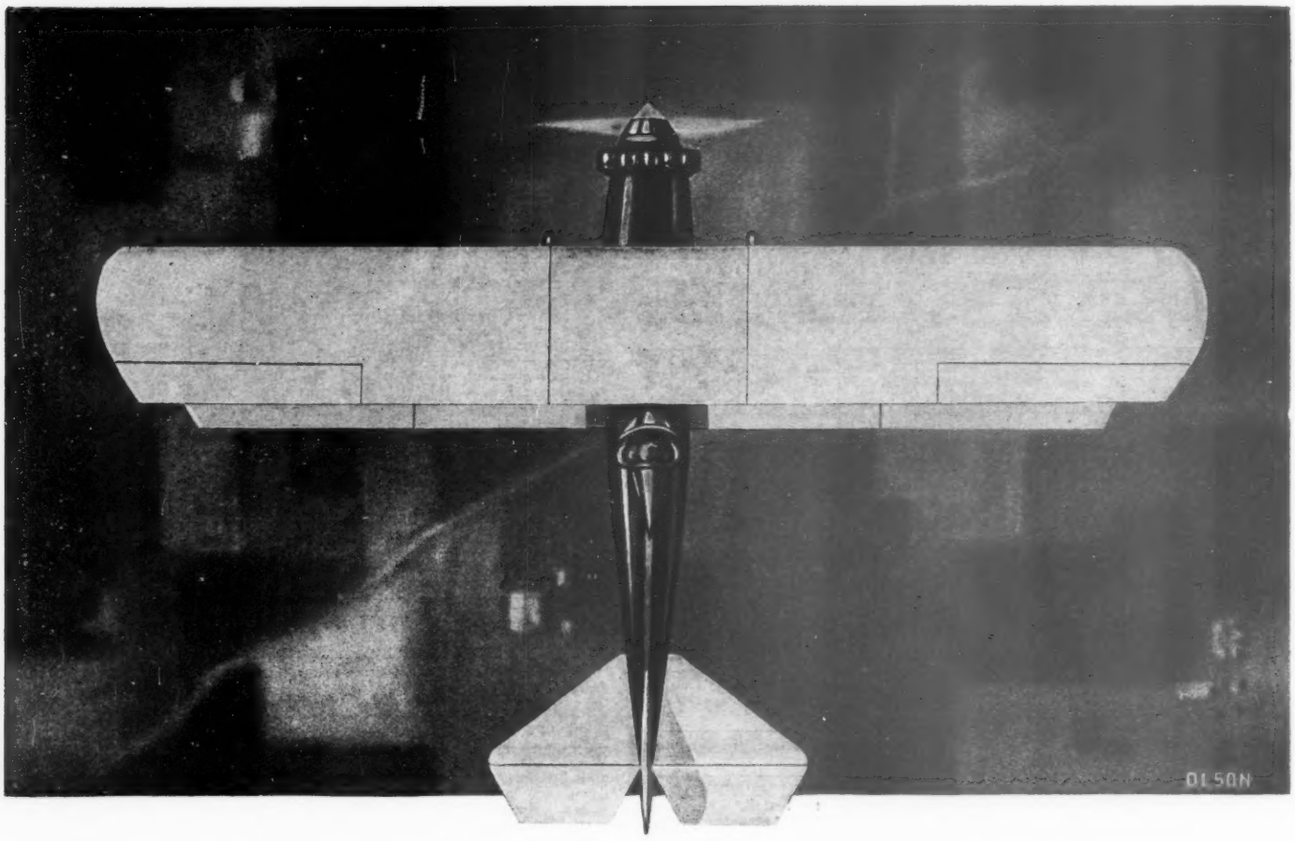

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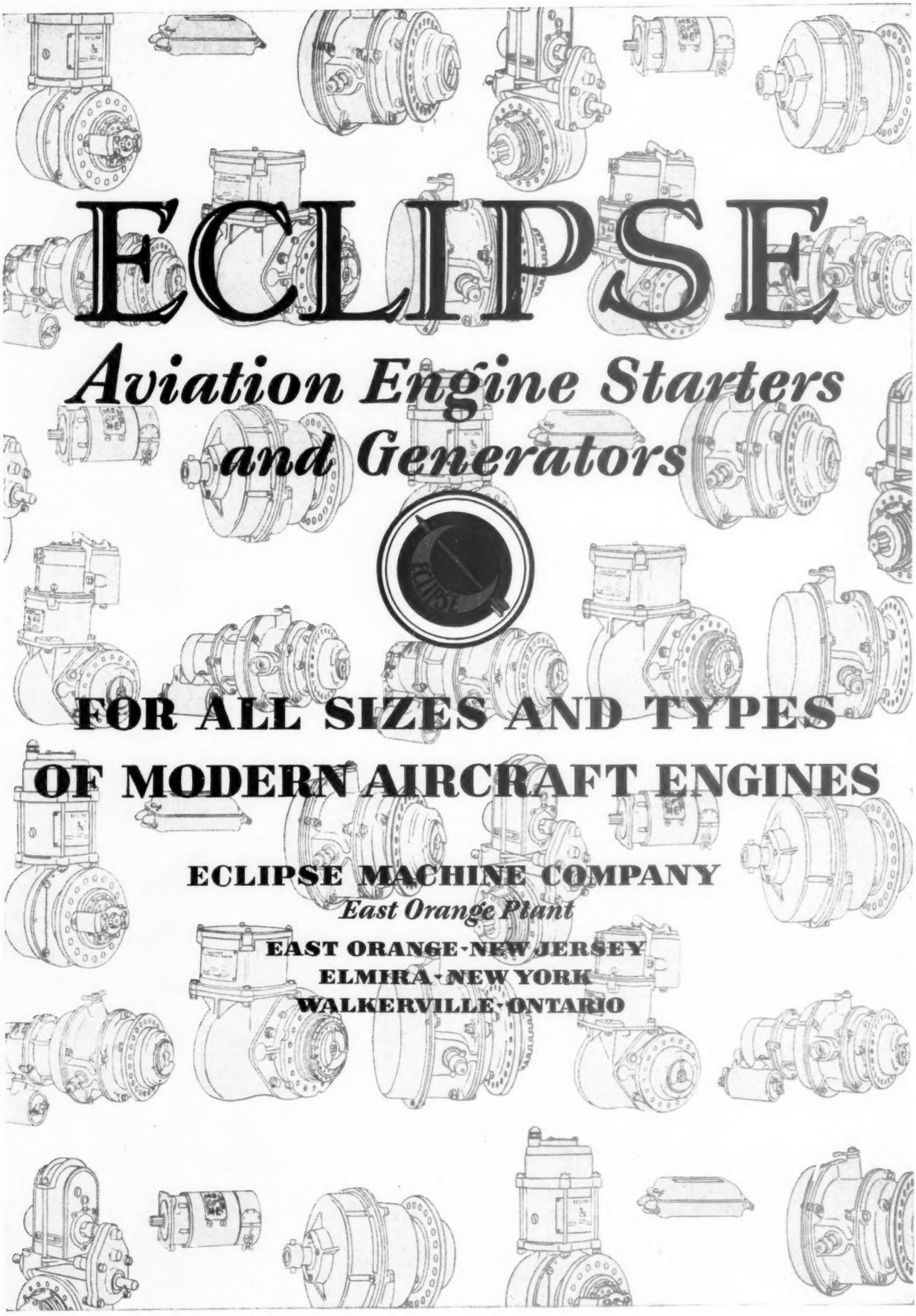

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